OCCUPATIONS

GOWIN AND WHEATLEY

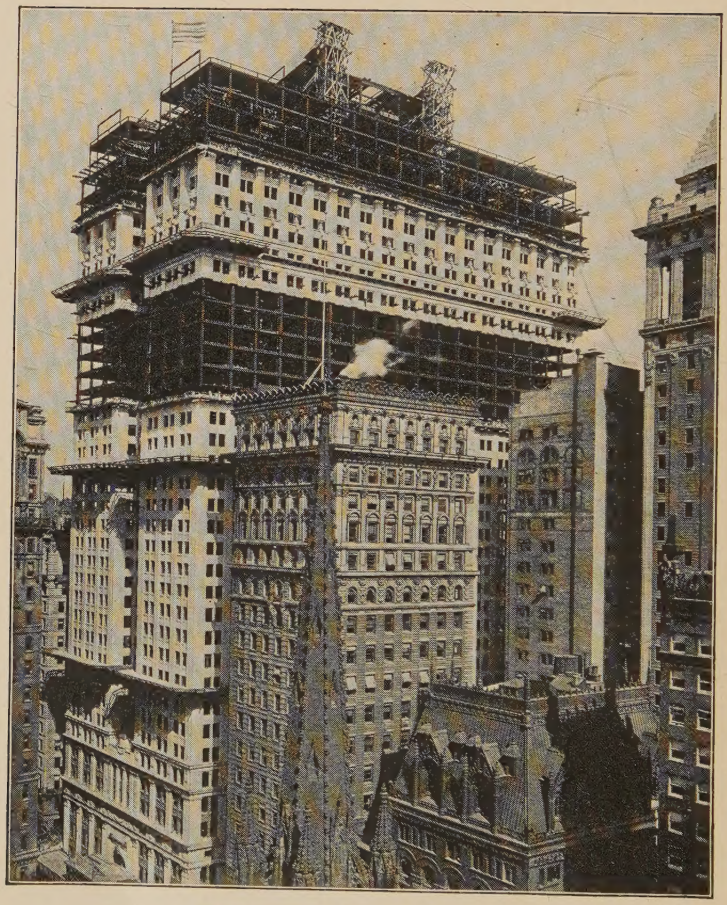
371.4
G.T.N.

KING COLLEGE LIBRARY

KING COLLEGE LIBRARY

King College Library

1924



Building an American "skyscraper"

Two thousand men worked twelve months in the construction of this splendid office building. Thirty million dollars was spent for land, materials, and labor; 40 stories were built; and offices were provided for 15,000 persons. A structure worthy the men of various vocations — architect, contractor, workman, business man — who coöperated to produce it

OCCUPATIONS

A TEXTBOOK IN VOCATIONAL GUIDANCE

BY

ENOCH BURTON GOWIN

ASSISTANT PROFESSOR OF COMMERCE, SCHOOL OF COMMERCE ACCOUNTS, AND FINANCE, NEW YORK UNIVERSITY

AND

WILLIAM ALONZO WHEATLEY

SUPERINTENDENT OF SCHOOLS, MIDDLETOWN, CONNECTICUT

GINN AND COMPANY

BOSTON · NEW YORK · CHICAGO · LONDON
ATLANTA · DALLAS · COLUMBUS · SAN FRANCISCO

2997

COPYRIGHT, 1916, BY ENOCH BURTON GOWIN AND
WILLIAM ALONZO WHEATLEY
ALL RIGHTS RESERVED

219.4

The Athenæum Press
GINN AND COMPANY • PRO-
PRIETORS • BOSTON • U.S.A.

PREFACE

In choosing his life work the young man faces a problem of vital importance, and he should act upon the best possible information and counsel. It is no satisfactory solution to leave him with the vague statement "The world lies before you," or to tell him "There is always room at the top"; nor is the matter settled by saying "You need more training." The young man learns after a time that the real test lies not so much in ambition and upward looking as in effort well directed. He then wants to know what may be done and where to take hold.

In three different, yet closely related ways, the vocational needs of such a young man are being met. The first is vocational education, the movement represented by the rapidly increasing establishment of trade and technological schools. The second is vocational guidance administered through vocational counselors, a most valuable work initiated in Boston and fast spreading to other large cities. The third plan, vocational information, is based upon the view that when the young man has the vocational materials with which to think, and is stimulated by parent or teacher to make use of these data, his mind will generally shape up the right solution. In other words, he will eventually place himself in his life work.

The plan of this book is a combination of vocational guidance and vocational information, with the emphasis placed strongly upon the latter. It has been found by the authors — especially by Mr. Wheatley, who has supervised this work in high schools for some six years — that the method of surveying in a concrete way the various occupations usually

brings about a natural adjustment of the young man to his life career; and the immediate reason for writing this text was the belief that similar results might quite readily be duplicated in other classrooms.

Each chapter of the book contains numerous exercises, readings, and references, the special purpose of the exercises being to localize information. In the Appendix are given lists of selected volumes for vocational libraries. A collection of the most helpful books can be secured for a few dollars, and for twenty to twenty-five dollars one can buy a very good working library treating all the leading vocations. Considerable material can be secured without cost; mention of this is made both in the chapter references and in the Appendix.

By pupils in the first or second year of the high school the course here presented can be completed in a half year with daily recitations, or in a whole year with recitations coming two or three times a week. The text permits considerable freedom on the part of the teacher, however, both as to the length of the course and the relative emphasis to be placed on the different vocations. Each teacher naturally will consider first his own community and the needs of his class, and, while requiring all pupils to study the text as a whole, will omit certain exercises and references and assign special topics as may seem advisable.

We are confident that such a study of vocations, besides being intrinsically interesting to the pupils, gives them greater respect for all kinds of honorable work, helps them later to choose more wisely their life work, convinces them of the absolute necessity for a thorough preparation before entering any vocation, and holds to the end of the high-school course many who otherwise would drop out early in the race. These results have actually been realized in our practice, and we believe that such service should have a place in all high schools, which are the people's elementary colleges.

The personal information of vocations gained on our part through practical experience and study has been considerably extended by the experience of others. People in general have been found to be very much interested in this vocational study and ready to place at our disposal their own occupational experience. It was the plan to give credit in the Preface to all these persons, but the list of those who have contributed either information or criticism worthy of note has grown so extensive that considerations of space compel its omission, though this does not lessen our appreciation of the service rendered.

At the time the reprint of this book has been called for we are in the midst of the Great War, under whose influence vocations are being profoundly reshaped. The demand for increased productivity of the things essential in carrying on the war and for the curtailment of all less essential activities has altered greatly the emphasis which the author, writing in peace times, placed upon the various vocations. Manufacturing, machine and related trades, and the engineering profession are now, in view of the changed conditions, undermanned; the learned professions, real estate, advertising, and the building trades are for the time being less attractive; millions of our men are in military service; wages in most cases have advanced far beyond the figures cited in the text; and women in unusually large numbers are taking up many of the positions described in this book. How long these and other decisive changes will persist cannot be known at this time, since the duration of the war itself is a matter involved in many uncertainties. It is our plain duty, however, to produce with all possible effectiveness under these new war conditions, and to be ready, after the war is over, to readjust ourselves to the different but interesting days which will then lie ahead.

THE AUTHORS

CONTENTS

PART I. INTRODUCTION TO THE STUDY OF VOCATIONS

CHAPTER PAGE

I. Importance of Vocational Information 1
II. Characteristics of a Good Vocation 7
III. How to study Vocations 21

PART II. DETAILED STUDY OF THE MOST IMPORTANT LIFE VOCATIONS

IV. Agriculture 31
V. Commercial Occupations 66
VI. Transportation 99
VII. Civil Service 127
VIII. Manufacturing 140
IX. The Building Trades 163
X. Machine and Related Trades 196
XI. The Engineering Professions 221
XII. The Learned Professions and Allied Occupations 245
XIII. Miscellaneous and New Openings 275

PART III. VOCATIONAL ADJUSTMENT

XIV. Choosing your Life Work 301
XV. Securing a Position 321
XVI. Efficient Work and its Reward 338

APPENDIX 349

Vocational Libraries 349
Reference Works 350
Free Material Available 351

INDEX 353

LIST OF ILLUSTRATIONS

	PAGE
Building an American "skyscraper"	Frontispiece
Plowing with a gas tractor	32
Harvesting grain with a binder	39
A trained farmer at work	43
Cutting and threshing wheat in Oregon	49
A dairy farm	51
A poultry farm	54
The organization of a commercial concern	83
A through express train	100
A powerful freight locomotive	102
The operating department of a railroad	105
A railroad roundhouse	107
A switch yard	109
"King of the telegraphers"	111
Organization of traffic department	113
Financial and accounting department	117
A railroad's headquarters	118
Conductor giving engineer the "high-ball"	122
Factory work	142
Interior view of a modern factory	143
Diagram of the production department	147
Operating a disc grinder	149
Studying a turntable lathe	152
A factory process requiring trained men	154
Apprentices at school	158
George Westinghouse — inventor, engineer, and business man	160
At work on a skyscraper	176
The building contractor begins work	188
An insurance company's home office	191
A machine tradesman	197
The machinist at work	201
A fine example of the machinist's skill	203
Turning car wheels	210
Driving a motor truck	216

PAGE

The Pennsylvania Station, New York City 222
Tunnel under the Hudson River 226
A modern power plant 228
A public-service power house 233
The Grand Central Terminal, New York 237
A famous technical man 240
The engraver 287
A modern printing press 288

OCCUPATIONS

PART I

INTRODUCTION TO THE STUDY OF VOCATIONS

CHAPTER I

IMPORTANCE OF VOCATIONAL INFORMATION

There is no greater blessing in this world than a steady job, with increasing efficiency and hence increasing wages as time goes on. — PAUL H. HANUS

The average man must earn his own livelihood. He should be trained to do so, and he should be trained to feel that he occupies a contemptible position if he does not do so. — THEODORE ROOSEVELT

The boy's duty and necessity of self-support. No duty comes closer home to a young man than becoming able to support himself. He may dream dreams and talk grandly of what he is to do, but unless he is able first of all to take care of himself he fails. This fact is recognized by all ambitious boys. They scorn to think of always looking to their fathers for support; instead they plan careers of usefulness and seek earnestly to make these plans real.

Self-support is something many are obliged to face early in life. Thrown upon his own resources, Horace Greeley mounted step by step from humble printer to founder and editor of the *New York Tribune*. Albert J. Beveridge entered college with only $50 loaned by a friend, and during vacations

cut wheat in the harvest fields. Many of our recognized "Captains of Industry" began at the bottom as poor boys, and our greatest national hero, Abraham Lincoln, inspires because he conquered so many and such difficult obstacles. What those men, and scores like them, have accomplished is being done to-day in a more humble yet praiseworthy way by millions of men. Whoever performs useful labor, does it well, and lives honestly and sincerely, shares the glory of doing the world's work.

The opportunities in the world's work. This work of the world now lies before you. In it you are eager to play a large and worthy part. And you wonder, just as boys for generations have wondered, "Is there any place for me?"

There certainly is much to be done. This is preëminently the age of big tasks for all who will qualify. The farmer in 1912 raised a crop which sold for $9,532,000,000, an increase over the year before of more than $1,000,000,000. The manufacturer, as well, has much to do. Into his factory pours a large part of this enormous stream of raw materials, and from the shipping room issues an annual product of necessities, comforts, and luxuries worth $20,767,000,000. Manufacturing has added enough value to the raw product to make a string of five-dollar bills that would go around the world eight times, and it furnishes employment for an army of nearly 8,000,000 men. To carry these products back and forth demands railroads. We have them, the greatest in the world, requiring 2,000,000 freight cars and manned by 1,600,000 employees.

Other activities are on the same gigantic scale. Our merchants have their bales of goods piled high in the warehouses of China and South Africa, and at home every American is able to buy of his local dealer products formerly denied a king. The engineer with mathematical formulas and transit directs the building of tunnels under rivers, through which thousands of people daily ride, or throws great dams across Nile or Mississippi. The chemist discovers new food products and

renders valuable what was formerly waste, and thus becomes the right-hand man of the manufacturer. Then there are the millions of builders, machinists, factory employees, doctors, lawyers, teachers, civil-service employees and countless other workers, a vast army — and what mighty tasks are theirs.

The boy's eagerness to begin work. Boys of red blood are eager to take hold, to feel coursing through their veins the joy of profitable effort. While most of them are obliged to earn money, all will agree with Dean Davenport that "every man is a better man if he feels the power to earn his way, whether he needs to do it or not." They see idlers and loafers and despise them. They see the industrious and the efficient doing things and reaping rewards and with these they choose to be. Millions of young men everywhere are as ready to play the game well on life's field as on the high-school gridiron.

And yet why about us are so many failures? It is sad but true that boys of promise often fail miserably in adult life.

Not long ago [says Dr. O. S. Marden] three college graduates were found working on a sheep farm in Australia, one from Oxford, one from Cambridge, and the other from a German university — college men tending brutes! Trained to lead men they drove sheep. The owner of the farm was an ignorant, coarse sheep raiser. He knew nothing of books or theories, but he knew sheep. His three hired graduates could speak foreign languages and discuss theories of political economy and philosophy, but he could make money. He had made a fortune, while the college men could scarcely get a living.

Results of purposeless drifting. Would you consider washing dishes proper work for the college-trained man? Yet we are told that in a certain dishwashers' union of 700 members, 100 are college graduates. One member of this union, himself formerly a college instructor, says:

Naturally I do not care to reveal my name. We represent a class of men who have found ourselves unable to cope with the harsh requirements of life. We are absolutely unfitted for business life, but I might

have succeeded if I had had even a rudimentary knowledge of business affairs. I was unmarried and came West with just enough money to last me a week. At first I tried the rough work, but I was unable to endure its hardships, so I became a dishwasher.

The foregoing is the confession of a drifter, and drifters are found everywhere. If you come to know some harvesting gang which migrates over the Western wheat fields, you will find in it men who should themselves be owning rich farms instead of seeking chances to work on one. If you study tramps as they use old tomato cans for coffee and discarded railroad ties for seats, you will find that many are men who should be driving trains instead of stealing rides. If you stand in sympathetic mood beside the Bowery bread line, visit employment agencies, look over "want ads," hold in your hand the many applications received for the most ordinary position, it is clear that here, too, are men whose fine ability has been feebly or unwisely directed. The longer you ponder over this matter the more deeply will the truth be burned into your mind, that the *world has many drifters and that drifting is dangerous.*

Do you know that by drifting you can get into just such a plight as these men? But such failure is not for boys who have set out to make good. You must take a positive attitude toward life and its work. You must be a pilot who takes firm grip of the tiller and sends the good ship straight to her goal.

The simplicity heretofore of choosing one's vocation. But that raises a most serious question, the old, old question over which generation after generation of young men has puzzled, What is my goal? What am I going to be? This question, too, is becoming harder and harder to answer. A boy in one of the little villages of one hundred years ago knew something of practically every vocation. His father, perhaps, was a tradesman, with close acquaintanceship with other tradesmen of the village. The boy could watch the blacksmith at work, he could see the weaver weave and the

baker bake. He had some understanding of what was done by the minister, the doctor, and the lawyer. His teacher and the whole community knew him twenty-four hours of the day, and were interested in what he was going to be. So, making use of their well-founded advice and of his knowledge of what the few simple vocations offered, he usually made his choice wisely and was fitted into his life work.

The complexity of choosing a life career nowadays. But this simple industrial system has changed and has become wonderfully complex. Men no longer do *things*, but they do *one thing*, and in many cases only *part* of one thing. Instead of there being a place in the crossroads store, where one may find out if he likes it, mercantile life to-day has so many different kinds of establishments and so great a variety of work in each that the average boy is simply bewildered and would waste much time in trying to find out from first-hand experience what he is best fitted for. No boy of to-day can work up to a responsible position in the field of transportation by becoming a stage driver or a yard boy for the freighter. No boy learns to-day what industry holds for him by watching the blacksmith or the cobbler. Their work is now done by the specialist; there are so many different positions in engineering and manufacturing, and so definitely is the work partitioned off that in a modern shoe factory, for example, one man may spend his life simply making heels. Our economic and social system is like a gigantic watch into which myriads of men, as wheels, must be adjusted. But, unfortunately, there are no all-skilled adjustment makers, and the danger is great of round boys getting into square holes.

Placing a round boy in a square hole means a misfit for a time or for life. Cowper tried to be a lawyer; Goldsmith tried to be a physician. Both failed miserably, but they made brilliant successes in literature. A. T. Stewart was unsuccessful as a minister and did not find teaching congenial. The failure of a friend to whom he had loaned money left him the

possessor of a dry-goods store. Here was something for which he was fitted, and consequently his name came to adorn the greatest department store of New York. Schiller started to train himself for surgery. Handel, according to his father's plans, was to be a lawyer. Claude Lorraine was apprenticed to a pastry cook. But the drama, music, and painting claimed them and were enriched by their genius. Every man is good for something. He must put forth effort, but this effort should be directed toward that for which he is fitted.

You wish no tragedy of a misfit life; you, too, purpose to make the most of yourself and to find and fill your proper calling. Appreciating this desire and need of young men, the authors have written this work for the express purpose of helping you to make the best choice of a vocation and to realize the most successful life career.

EXERCISES

1. Make a list of the principal vocations in which the people of your community are engaged. What vocation do you know most about? What vocation are you most interested in?

2. Instead of studying many life-vocations and considering a choice of the most suitable, would it be wise to take the first job offered and work up from that?

3. Has any striking example come to your attention of a man who is doing what he seems best fitted for? of a man who has not yet "found himself"? of a man who is a misfit?

4. Give reasons for some of the many vocational failures we see about us.

5. Why is it harder to-day than it was fifty years ago to choose wisely a life career?

6. What benefits do you expect to gain from taking this course in vocational guidance?

CHAPTER II

CHARACTERISTICS OF A GOOD VOCATION

Occupations determine the fundamental modes of activity, and hence control the formation and use of habits. — JOHN DEWEY

The situation sifts down to this: energizing work is decreasing; enervating work is increasing. Yet it is fundamental that mankind must do stimulating work or retrogress. — HERMANN SCHNEIDER

Boys all want good positions. But would they know one if they found it? Many men have thought that they had the question answered and have secured what they thought to be a good position, only to learn in middle life that it meant disappointment instead of satisfaction, narrowness instead of growth, and failure instead of success. Since this is a complex world, there are many things to consider before deciding what a good vocation is, and just because Mr. Smith, the barber, looks prosperous or Mr. Jones, the real-estate dealer, says there is nothing like selling land, you must not jump at conclusions in this important matter.

Let us, then, try to unravel this question, What is a good vocation? Whether a vocation is good or bad, as we shall soon see, does not depend on one thing only, but upon a number of different elements. In other words, we might say that there are *several* characteristics of a good vocation, not one characteristic. And among these let us consider at once the one which no doubt comes to your mind first.

Remuneration. You are naturally interested in a salary check; you want to know what pay there is in a particular vocation. You hear much of wages — how one of your friends gets $2.50 a day in a piano factory and another friend $20 a week in a big department store. We are apt to conclude

that friend No. 2 is luckier than friend No. 1, or that the store owner is better to work for than the factory operator. But upon what does the amount of wages depend? There are several points to consider in answering this question. One is, Why is the employer able to pay you any wages at all?

1. *Productive work and wages.* The reason is, your work is productive. If you take a team and cultivator and spend several weeks at work, next fall there are many more bushels of corn as a result of your work. If you touch briskly the keys of a typewriter, day after day, a profitable business is better able to continue than if your work had been left undone. The employer can afford to pay you because he makes money out of your work. How much can he afford to pay you? This depends very largely on what you can produce. Here is something which every young man aiming at a high salary should never forget: *You must not expect more wages than you are worth, and you are not worth more than you can produce.*

The very plain duty of every young man, therefore, is to make his work productive. This is the royal road to the employer's heart. If you knew that by investing in Toledo knives at 50 cents you could sell any number of them in your home town for $1, would you not hasten to buy? Would not Toledo knives stand high in your estimation? In the same way your employer considers you. If you are such a good producer that from the wages he invests in you large sums are received, will he not feel that he has a most desirable young man in his employ? Will he not value you highly? Would you continue to buy Toledo knives at 50 cents if you could sell them for only 35 cents? With no more right can the employer be expected to esteem highly the clerk upon whom he is constantly losing money. You must keep it clearly in mind, consequently, that you are paid because you can produce and that it is to your advantage to become constantly a better producer.

2. *The amount of wages and its relation to the supply of workmen.* Again, if your employer can get at a less wage

somebody else who will produce as much as you and as well, will he continue to pay you the same wages? This, you see, is the other side of the wage bargain, the amount of wages depending upon the supply of laborers. If there are many wishing to do a certain kind of work, wages will be low because the supply is plentiful. If, on the other hand, the supply of workers is too few, then wages will be relatively higher.

What helpful things can we learn from the supply-and-demand-side of the worker? Chiefly these: to recognize the important factors that contribute to an undersupply of workers in certain vocations, and then to enter a vocation where the supply of workmen is comparatively limited, as in the following cases: (1) Special qualifications may keep most men out. The designer, for example, requires gifts so unusual that the supply of first-class designers is never too great. (2) Expensive training, which parents are often unable to give, may allow only a few to qualify. A high-school graduate can complete in four years his medical education in some schools, but it requires a college education and five years' medical training, with hospital practice and possibly further study abroad, in order to become a high-grade specialist. (3) Or, changing demands may render the supply inadequate. The advent of the automobile — its sale soon amounting to millions annually — found the supply of mechanicians limited. But should large numbers of people take to aëroplanes or return to horses, it would quickly lower garage rates and swell the supply of mechanicians. Good advice is to shun vocations decreasing in importance and enter those which have an expanding but safe future. If, in addition, you possess the special qualifications or can secure the necessary training, you will be more certain to find numerous openings at fair salaries.

3. *Other factors entering into the amount of wages received.* But you may neither possess the special qualifications nor be able to take the required training. Your rate of pay then will depend largely upon how good a bargainer you are.

You have a right to demand what your services are worth. Your employer has a right to offer what someone else could be hired for to do the same work. The actual wage, consequently, is somewhere between these two points, the precise figure usually being the result of much discussion. Collective, not individual, bargaining is the plan of the labor unions. No locomotive fireman, for instance, ever talks with a railroad president concerning whether his daily wages shall be $2.85 or $3.15. Representatives of thousands of firemen meet representatives of many railroads and the wage schedule is arranged. In whatever way wages are regulated in the vocation you will enter, you should see to it that you are paid as nearly as possible what you deserve.

In writing this book we have had many letters from, and interviews with, both employers and employees. The employer often says, "We always have numerous vacancies," "We can't get enough applicants of the right sort," etc. What he means is that for the prices he is willing to pay applicants are few. Or, more precisely, he has difficulty in getting production carried on at the price he desires. The employee just as often says, "Good jobs are scarce," "The demands are hard to meet," "I would not encourage young men to enter this work," etc. What he means is that for the wage he desires to receive positions are few. Or, more precisely, he has difficulty in selling his production power at the price he desires.

Young men should not be unduly elated over the prospects painted by the one, nor should they be unduly dismayed by the difficulties voiced by the other. The truth of the matter is, the young man who is a good producer in any vocation not crowded and who is willing to make fair terms with his employer is practically assured of employment at good wages.

4. *Comparison of daily, yearly, and life earnings.* But which is more important, daily wage or yearly income? Young men are apt to be swayed by the special earning —

the high harvest wage, the league pitcher's salary, the big law fee. But as you live all the time, so you should earn all the time. It is the total amount received during the year that counts. In the large wage-earning class Dr. Scott Nearing estimates that the average worker is unemployed 20 per cent of the time. For example, instead of considering $2.50 a day the wages received by a certain workingman, we would, after deducting this 20 per cent, really be dealing with a $2 wage. Irregular work does not pay in the long run. Consequently, one of the tests that young men must apply to any particular vocation is, Does it afford constant employment?

Yearly wage, however, is not enough. Annual earnings are more important than daily earnings, but life earnings are more important than either. This truth leads us to consider three matters of importance, all closely related to remuneration. These are healthfulness, safety, and the likelihood of advancement, which we shall treat in the sections that follow.

EXERCISES

1. "The company does n't pay enough," said a boy who had quit his position as secretary to the roundhouse foreman. Upon what should the amount of the boy's wages depend?

2. "I have Sam Holton beaten," said a boy to his father. "He gets $1.50 and I get $1.75." What questions should the father ask?

3. Have you ever heard employers and employees talking over wages? If so, in what ways were their views different?

4. What are the average weekly earnings of all wage earners? See page 11 of the census bulletin mentioned at the end of the chapter. Could you live the way you wish on that amount? How can you earn more than the average worker?

Healthfulness. 1. *The difference in the healthfulness of vocations.* Do you know that by choosing some vocations, unless under the most improved conditions, you will shorten your life five, ten, or fifteen years? Some of our decorated pillow covers are made in factories where the workers unprotected

breathe constantly the arsenic fumes, the spray frequently being so dense as to resemble a mist. Paint and pottery workers find that lead poisoning destroys the appetite and leads to nausea, loss of weight, and low vitality. In a California factory unequipped with respirators men who were willing to shovel in the lime pit received double the usual pay, and workingmen were found foolish enough to do it. Foolish? Yes, for at such work they could last only from four to six years, being forced at that time to leave the lime pit injured for life.

If one of your classmates were shot down in cold blood it would create a sensation. But until recently thousands of young men were actually killed every year, the murderers being flying bits of sand, steel, and dust. When a granite worker turns on the sand blast the air is filled with the fine, sharp particles. If these reach the lungs they are a fruitful source of that dread occupational disease, tuberculosis. Grinding cutlery and polishing the moldboards of plows have been found so injurious that only foreigners ignorant of the effects would do such work. And they lasted but from five to ten years.

2. *The constant improvement of conditions in unhealthful vocations.* So dreadful have the ravages of tuberculosis and other occupational diseases proved that a united movement is now well under way to lessen the danger. Respirators, devices placed over the workmen's noses through which the air is filtered, afford part protection against fumes and dust. The offending particles may not only be screened out but also drawn away by means of exhaust pipes over the emery wheels, saws, vats, etc. Improved ventilation and lighting systems are being installed, and in many industries the use of the most injurious poisons is being prohibited by law. In whatever ways employees find their occupations unhealthful, they should demand from their employers the best means of health protection known, and should themselves exercise every possible precaution both in their work and in their habits of living.

Thus we see that the public at large has awakened to the fact that the healthfulness of the worker is a vital matter that must be safeguarded, and, as a result, practically all occupations dangerous to health are gradually being rendered more safe. However, there are still many decidedly unhealthful vocations that should be shunned by those who can avoid them until they have been made far less dangerous than they now are.

This may not always be possible, however. You may be obliged to work near dangerous machinery or in a badly ventilated room. But these things you can do: use caution when near the machinery, try your best to secure more healthful conditions in the workroom, and during nonworking hours plan to restore your vitality daily by proper habits of rest, sleep, and recreation.

EXERCISES

1. If your lungs are weak, what occupations should you especially avoid?

2. If your eyes are poor, what occupations should you especially avoid?

3. In some high-grade stores, banks, office buildings, and factories you have visited, what arrangements were made for ventilation, lighting, heating, drinking water, wash rooms, janitor service?

4. Of what importance are these essentials of hygiene? Have you ever visited a store, factory, or the like, where they were neglected?

5. What conclusions from this discussion of healthfulness can you draw for your personal guidance as to a choice of vocation? as to a choice of a particular firm with which to work in this vocation?

Safety. 1. *The difference in the safety of some vocations.* Some vocations are not safe. Do you know that it is more dangerous to work in certain occupations than it was to be a soldier in the Civil War — that insurance companies refuse to take such risks? In Allegheny County, Pennsylvania, the county in which Pittsburgh is located, the month of January, 1907, saw 60 death accidents; February, 36; March, 43; April, 51. If it had not become so common

as to be no longer "news," every daily paper could tell of switchmen being crushed between cars, firemen mangled in train wrecks, structural workers falling from high girders, hurrying messengers run over by automobiles, factory employees losing arms in heavy machinery. Death lurks in unprotected belts, big stamping machines, buzz saws, the haste and confusion of building operations, street crossings, and switch yards. Your life represents your most valuable investment, it is your most precious possession. And when insurance companies, composed of shrewd, farsighted men whose specialty it is to estimate danger, refuse to accept your risk, is it good business on your part to ignore these dangers in selecting your vocation?

2. *The improvement of conditions of safety in dangerous vocations.* While some vocations are by nature safer than others, still even the dangerous ones can be made safer than they are now. A number of years ago brakemen were compelled to step over the rails and stand between the cars when coupling them. So many brakemen slipped or stumbled and were run over by the car trucks, or had their hands crushed by the bumpers, that automatic couplers have for some years been required by law. The United States Steel Corporation, alarmed at the death toll in their mills, organized committees of safety to inspect the shops regularly. By guarding belts, gear wheels, etc., and impressing all employees with the slogan "Safety First," they have very much reduced the number of accidents. What the Steel Corporation has done is also being done by hundreds of other manufacturing and railroad companies. Most states have passed laws for safety, and inspectors see that the requirements are carried out.

It is to your interest, as a young man about to enter a vocation, to consider safety as one of the desirable elements. And if you decide to work in a somewhat dangerous occupation, give preference to the employer who considers the safety of his employees and do your part by coöperating with him.

EXERCISES

1. Mention several occupations in which a workman might have his hand crushed or might lose an arm or a foot.

2. Which occupations are especially dangerous? Which ones are especially safe? (Your local insurance agent will help you on this. Ask him how his company classes risks.)

3. What is meant by "workmen's compensation laws" which state legislatures are passing? Secure a copy of such a law if your state has one.

4. What rules can be drawn up on how to avoid accidents? (See Tolman and Guthrie, Hygiene for the Worker, pp. 151, 152.)

Advancement. 1. *Andrew Carnegie's advancement.* Andrew Carnegie began his manufacturing career as a "bobbin boy" at $1.20 a week. He tells the story himself in his "Empire of Business":

I have had to deal with great sums. Many millions of dollars have since passed through my hands. But the genuine satisfaction I had from that one dollar and twenty cents outweighs any subsequent pleasure in money-getting. It was the direct reward of honest manual labor; it represented a week of very hard work — so hard that, but for the aim and end which sanctified it, "slavery" might not be much too strong a term to describe it.

For a lad of twelve to rise and breakfast every morning, except the blessed Sunday morning, and go into the streets and find his way to the factory and begin to work while it was still dark, and not be released until after darkness came again in the evening, forty minutes' interval only being allowed at noon, was a terrible task.

But I was young and had my dreams, and something within always told me that this would not, could not, should not last — I should some day get into a better position.

As we all know, he did get a better position. He soon became a fireman in another factory, was next set to keeping the books, and at fourteen became messenger boy in a Pittsburgh telegraph office. Then he learned telegraphy, became clerk and operator for the superintendent of the Pennsylvania Railroad Company, and later advanced to a division superintendency on the same road.

He invested in some Adams Express stock, took a part interest in the company which made the first sleeping cars, finally resigned his railroad position to organize a new steel-bridge-building company, and thus developed into the world's foremost steel king. And this is the way Andrew Carnegie worked his way up.

2. *The responsibility of the young worker.* You also purpose to become a man of importance. You may find a promising position which not only pays well at the start but offers steady advancement. Or it may be that the only position open to you will be a very humble one like Andrew Carnegie's first job. In either case, in order to rise you must grow. Much depends on yourself. Are you willing, if need be, to toil hard with little pay at the start, to go out of your way to do things, and to learn things that touch your present work on all sides? Are you determined to please your employers and all whose labors interlock with yours? Are you industrious, studious, thoroughgoing, gentlemanly, honorable? — for much depends on yourself.

3. *The opportunity in the position.* Much also depends on the position. In some positions a young man learns nothing and cannot grow. Ten years finds him receiving the same wage, and with his mind cramped and distorted like a twisted tree. So, while we are naturally interested in good pay, we must not be misled by too large wages at the start in a vocation which does not offer us steady growth, added responsibility, and a decided advancement in salary. There are positions and vocations in which an ambitious young man is ever advancing; as in a good school, he goes from class to class until finally he graduates, but in this case he passes up into a membership of the firm or into some other position that has been his goal for years. Truly, we must bear in mind in choosing our life work that a good start is not enough; it is the steady advancement and a worthy goal that all should seek.

EXERCISES

1. Explain how good pay at the start is of less importance than the opportunity for continued advancement.

2. What is meant by a "blind-alley" position? Why do so many young men accept such a position?

3. If you should secure a position that offered a promising future, how would you plan to work up to the top?

4. If you, as president of some large corporation, needed a general manager, would you employ some manager working for a competing company or would you place your assistant general manager in full charge, raise the superintendent to assistant general manager, and so promote all along the line?

Social standing. 1. *Its partial dependence upon the vocation.* There was a time when a young man ambitious to stand high socially thought that he must enter one of the professions. This conception probably came as a tradition from England, where for generations the clergyman, the doctor, and the lawyer have ranked socially near the aristocracy. And to win this social advantage many a young man has entered professional life only to fail miserably when he could have succeeded admirably as a merchant, a machinist, or perhaps as a farmer.

The traditional social standing accredited to some of the various life occupations still persists to a degree, and influences many boys unwisely in the choice of their life work; but fortunately in democratic America men are now receiving more and more that esteem from the public which their services and personal worth entitle them to receive, regardless of whether they have served their fellow men in a professional calling, in manufacturing, or as skilled artisans. Naturally there is still, and perhaps always will be, a sort of vocational aristocracy composed of those callings which demand native ability of a high order and a prolonged and expensive education, and which thus exclude all but a comparatively few who can meet their exacting requirements. Again, there is the

other extreme, that multitude of occupations which require no special qualifications nor education and whose workmen are termed unskilled labor — these occupations are generally overcrowded and naturally offer the least promise of social standing.

2. *Its greater dependence upon the worker.* As a rule, a young man in any life work requiring some special native ability and a fair education may expect to attain with reasonable surety that social standing for which his financial success and his personal traits, including his public-spiritedness, entitle him. So we can say with assurance, do not be afraid because of social considerations to follow the life calling for which you seem to be best adapted in native ability, personal inclination, and special preparation. Again, in the long run, the community usually esteems most highly that man who has lived and worked with human welfare nearest his heart.

EXERCISES

1. What vocations that you know something about seem to possess good social standing? Is it the vocations themselves that give this standing or the excellence of the men engaged in them?

2. In your community is it the professional men or the successful men in other life occupations who seem to receive the most respect from the public?

3. Draw up a list of at least ten vocations which you think from their requirements and from the service they render deserve good social standing.

4. Make a list of ten prominent Americans of to-day. What does each do for society? What, broadly considered, does he receive for his services?

Personal suitability. 1. *Patrick Henry's personal aptitude for law.* As a youth Patrick Henry was an idler. Historians now say splendid things about him, but there was a time when his neighbors called him a vagabond. He tried one thing after another, but every venture failed miserably. He was foolishly married when not yet out of his

teens, and at the age of twenty-three the usual failure of his every project — this time a country store — left the youthful Patrick, now with a wife and three children to support, in sorry straits indeed. He turned to law. The beginning was slow, but the Parsons' Case fired him with enthusiasm for his new calling, and he forged ahead to become the most celebrated lawyer of his day. Patrick Henry failed for a time, and failed miserably, until he entered the *vocation for which he was fitted*. You too will find remuneration, healthfulness, safety, advancement, social esteem, all to be important, but do not forget personal suitability.

2. *Natural aptitude plus training as factors in a successful career.* All men are not alike. As boys, some by nature take to mechanics. They like to work with hammer and chisel and the clock that won't run. How dull to them would life be in a library working over names which fairly thrill another boy — Scott, Shakespeare, Stevenson, Kipling! Natural qualifications may peculiarly fit you for some one vocation. Out of it you are ill at ease, in it all goes well.

But natural qualifications are not everything. Training, education, cultivation are important. They take the crude natural qualifications and shape them for success. You may have the taste for accuracy, neatness, and figures. Training can make of you a high-grade accountant. In other words, education may further fit you, may adjust you to a vocation when natural qualifications alone would not suffice.

3. *The importance of an easy access to special preparation.* Now it may be that you have ready access to the special preparation required for some calling. Other boys, perhaps, must travel far, hold mean positions, and struggle for years to learn what you can easily gain from your father. All his life he has been storing up this valuable information. It is yours for the asking. Therefore, if your father's calling appeals to you as a life work, your father's being in it may be a considerable advantage. A somewhat similar advantage may

be in your location. You may live in a great manufacturing center; the attraction then would be toward a manufacturing career. Or your home may be in a great city; commerce would now make a strong appeal. Or your home may be just across the street from a famous technical school; a technical education here would be tempting. Other things being equal, going into a vocation where you have the best chance for preparation simply means taking advantage of the opportunities which are peculiarly yours.

EXERCISES

1. Should a boy follow his father's vocation? Discuss the pros and cons.

2. Does your community afford special training advantages for entering any particular calling? If so, is there a liability that many local boys personally unqualified for this calling will take the training and become vocational misfits?

READINGS AND REFERENCES

Earnings of Wage-Earners. *Bulletin 93*. Bureau of the Census, Washington, D.C., 1908.

EASTMAN, CRYSTAL. Work-Accidents and the Law. Charities Publication Committee, New York, 1910. $1.50.[1]

NEARING, SCOTT. Wages in the United States. The Macmillan Company, New York. $1.25.[1]

TOLMAN and GUTHRIE. Hygiene for the Worker. American Book Company, New York, 1912. 50 cents.

WINSLOW, C. E. A. Health of the Worker. Printed and distributed by the Metropolitan Life Insurance Company for the use of its policy holders, 1913.

[1] In the Readings and References prices are given merely as convenient guides to the user of this book in estimating the probable cost of the books he will need. Although care has been taken in ascertaining these prices, responsibility is disclaimed for any inaccuracies.

CHAPTER III

HOW TO STUDY VOCATIONS

It is at all times to be kept sharply in mind that the schools are not only to educate people in order that they may be educated, but also to educate them in order that they may do things. — ANDREW S. DRAPER

The best social service which the average man can perform is to do his regular work well. — THOMAS N. CARVER

To hold a position which suits you in every way is surely ideal. Like all ideals worth while this may be hard to realize, yet in the measure that it is attained a successful career results. Such a career, however, is not gained by mere dreaming. It is well to think of the future, of the great position with high salary, power, and social position; but do not stop at that. If you do, you are a visionary, and visionaries never succeed in life. Dream grand dreams — then go out and hustle to make them real. While your desire is to be a great merchant, banker, or contractor, your opening job may be as humble clerk, office boy, or apprentice.

The investigation of many vocations before selecting a life calling. It is because you are thus obliged to start at the bottom and only after several years can work up into a really satisfactory position that care must be taken to put this hard preliminary work into the particular vocation you will later on occupy as a man of influence. If you knew that in a certain place the gold ore became richer the deeper the picks went, would you not be very deliberate about selecting the particular place to sink the shaft? It would be clear that a miner who dug five years in one place, two years in another, three years in a third, would be the loser by so

much because his efforts were spent on inferior ore. So we say, do some prospecting before you begin to sink deep shafts in the vocation mines.

At the start let us take a brief survey of the whole field. There is first to be considered agriculture. Then the various openings in commercial occupations are to be investigated. Next comes railroading, followed by civil service and manufacturing. After these we shall pass to trades — the building and the machine trades. Engineering, too, must come in for due consideration. Then we shall study the learned professions, such as medicine and law. Finally there are a number of miscellaneous and new openings to be investigated, and our survey of vocations is then completed. An extensive field, is it not? It would have to be such since it concerns the life work of millions of men.

The study of both interesting and uninteresting vocations. It is very likely that some vocations interest you more than others; that you have long thought of some one, or maybe two, of these vocations; that you have visited, more than once, places where men worked in this vocation, and have talked with several of these men. Perhaps, when the new magazine is laid upon the drawing-room table or you sit down before the row of magazines in the library, you read first of all the article telling about the new bridge, or the lawyer's big case, or the wonderful methods of farming being worked out in a school of agriculture. Every month it is the same. You enjoy articles telling about a certain vocation because this life career captivates you.

In studying this book, when you come across positions which interest you particularly, give them special attention. This does not mean, however, that you are to turn hastily through the book, decide offhand which are important, and plan to give little study to others. These "others" represent callings followed by millions of men. Hence you will find that a study of vocations is going to be extremely

valuable to you outside of the help it will be in your own life work. "No man liveth unto himself alone." The really large life is that which overflows self at every turn. And that sympathetic understanding needed by the man who deals with others can in no way be more quickly gained than through a study of the daily work these other persons do. It is in this daily work that long hours are spent, and around it their life interests revolve.

The study of the vocations of others. It is not only the altruistic man who should study vocations but any other man who would be efficient. In order to do business, men must enter into relations with other men. The merchant studies his customers, their tastes, needs, earnings, special peculiarities, since in order to meet their demands he must know them. He studies the manufacturer as well, how his goods are made, the various patterns and styles, and the prices either direct or by way of the wholesaler. Again, he is obliged to study transportation, the rates and service afforded by freight, express, or parcel post. In fact, if all his business relations were mapped out on a chart, it could be readily seen that the successful merchant needs a wide range of information concerning people and their various occupations.

The same is true of a manufacturer: as one of them expresses it, "My business gets me into a little of everything." The cases of men in other vocations do not differ greatly. The lawyer, when his client is a farmer bringing suit against another farmer, needs the viewpoint of the rural man, and because his clientele represents many different classes of people he must be a well-informed man. The clergyman too should understand the banker, the butcher, the broker, the liveryman, else how can he most wisely minister to their needs? Every man's business connects him with many other men: society is a network of relationships; and whoever wants to serve society well must know people

in that which comes closest to the heart — their daily work. The efficient man, consequently, whatever his own calling, should study the vocations of others.

Comparison with facts of local vocations. How can you best use and supplement this book in your study of vocations? There are several practical ways in which you can do this.

1. *Use of the general information concerning vocations as a basis for comparison with local information.* In a letter recently received, the writer, a well-known efficiency expert, says, "In Detroit in the automobile business, machine-tool tenders earn as high as $5 and $6 a day, whereas in other sections the average wage will not run above $2 or $2.25 a day." Suppose this book states in general the wages of machine-tool tenders. Would this general information, with no supplementing of local facts, be of much practical value to you? The Detroit high-school boy might say: "That 's too low. They get more than that right here in our shops." The St. Louis high-school boy might say: "That 's too high. My father gets less, and he 's a good workman too."

Since conditions and wages vary widely, you can easily see the impracticability of giving definite and detailed information which will apply to different parts of the country. But it is with the particular conditions in your own community that you are to deal. Hence the importance of getting local information; it applies to you directly.

2. *Use of a simple questionnaire.* It would be well for your class or school to have printed enough copies of a vocational questionnaire so that each student might investigate at first hand, record his findings, and then report to the class on at least twenty-five life occupations. The questionnaire recommended for this work of investigating local occupations, that is, for localizing as much as possible of the vocational information found in this course, is the one which the authors used extensively in securing first-hand information for this book. The form, which should be enlarged to eight and a

half inches by eleven inches with plenty of space under such questions as will require the longest answers, is as follows:

WHAT HIGH-SCHOOL STUDENTS SHOULD KNOW ABOUT THE VOCATION OF.....

NATURE OF VOCATION

What are its *particular* advantages?
What are its most serious disadvantages?

REMUNERATION

What is the salary to start with?
What salary could persons of average success expect in their prime?
What is the demand for regular employment?
How many years is the average active career in this vocation?
Is the opportunity for advancement rapid or slow?

NATURAL QUALIFICATIONS

What natural qualifications are required?
What natural qualifications are desirable?

PREPARATION

What general education is required?
What special preparation is necessary?
What time is required for this special preparation? What does it cost?
How is this special preparation best secured? What school, if any, would you suggest?

Name.....Vocation.....Address.....

3. *Talks by local people.* It will surely be profitable to have some banker come to your high school and talk to you about banking. He can tell you all many things which will be worth hearing and which may prove especially valuable to the two or three boys who have their eyes on a banking career. The local manufacturer could speak of his business, the dentist could tell what dentistry offers to boys. Do not

forget that the carpenter, the plumber, the grocer, and the station agent all have much valuable information that you should be eager to hear.

But bear in mind that most of these men are used to doing things, not to talking about them. Do not expect as much of them in skilled speaking as of lawyers and ministers, whose vocations constantly require them to speak in public. They come to give you facts about a business, a trade, or a profession. And upon what they say in this connection you must bring your best judgment to bear. Some speakers will tell only the good things about their vocation; they will paint it in glowing colors. Others see many disagreeable features, and the general tone of their talk is discouraging. And when it happens sometimes that the same vocation is discussed by both the optimistic and the pessimistic tradesmen, it is fortunate for the class; since the result is likely to be a well-balanced picture.

4. *Learning of vocations from people you meet.* Think how many vocations daily fall under your observation. The milkman, the paper boy, the mail carrier, are around before you leave home in the morning. In walking down the street or riding on the trolley, can you not learn something about the vocation of the man at your side? You go into a store; customers are few, the manager may be in a talkative mood; what can you learn about the business?

Most people are so interested in what they are doing that they are willing to tell about their work. Moreover, they are usually interested in young men and are willing to discuss with them the pros and cons of their own vocation. However, much depends on the spirit in which a person is approached. If he feels that his private affairs are being pried into, he will become suspicious and stop talking. But if he understands your motive, usually he will be found willing to disclose everything except what is of a purely confidential nature.

5. *Visits to places of vocational interest.* Benjamin Franklin in his "Autobiography" gives the following quaint account of how his vocation was selected:

> I continued thus employed in my father's business for two years, that is, 'till I was twelve years old; and my brother John, who was bred to that business, having left my father, married, and set up for himself at Rhode Island, there was all appearance that I was destined to supply his place, and become a tallow-chandler. But my dislike to the trade continuing, my father was under apprehensions that if he did not find one for me more agreeable, I should break away and get to sea, as his son Josiah had done, to his great vexation. He, therefore, sometimes took me to walk with him, and see joiners, bricklayers, turners, braziers, etc., at their work, that he might observe my inclination, and endeavor to fix it on some trade or other on land. . . . My father at last fixed upon the cutler's trade, and my Uncle Benjamin's son Samuel, who was bred to that business in London, being about that time established in Boston, I was sent to be with him some time on liking. But his expectation of a fee with me displeasing my father, I was taken home again.
>
> From a child I was fond of reading, and all the little money that came into my hands was ever laid out in books. . . . This bookish inclination at length determined my father to make me a printer, although he had already one son [James] of that profession. . . . In a little time I made great proficiency in the business, and became a useful hand to my brother.

The world is much indebted to the influences that made Franklin a printer. Had he become a sailor as he threatened to be, or a cutler as he narrowly escaped being, it is speculation to say how greatly this change in his life work would have influenced American independence, but that its effect would have been considerable is safe to claim.

The best place to find out about work is where it is being done. It may be that (as in Franklin's case) much of the value of such trips will be in the general information obtained, and that so far as finding a suitable vocation is concerned, the chief result will be in showing the boy what he does not want to do. But he should keep on looking. Every community is a valuable vocational laboratory. Many

occupations are represented and much can be learned, even though it be a small town.

The use of the exercises and trade literature. In order to make the general information of this book more helpful, numerous exercises have been provided in connection with each chapter. It may not be possible to obtain all the information called for by these exercises. Your recitation hours may be too few, or it may be that you have no factory in your town, or no railroad, or no farms near at hand. But at least give careful and first-hand study to as many vocations as are accessible, since certain of these are almost sure to bear directly upon what is to be your life-career.

At the end of each chapter you will find listed various books and periodicals. Lack of space forbids a description of these, but their value for the study of vocations can scarcely be overestimated. Published for the workers in a particular trade, each of these publications will prove a first-class means of learning its ins and outs. So when you become interested in a certain vocation buy one of its books or subscribe for one of its periodicals. Your local book dealer can secure this for you, or if it is one listed in this book it may be ordered directly of the publisher, since his address and the price are given in each case. The cost, $1.25, $1.50, or even $3, is slight when compared with the benefit received. It is by no means a waste of money, but rather an investment. Reading such a book or magazine will mean real growth to you. Your producing capacity will be increased and advancement made more certain.

The profit in reading vocational books and magazines. An assistant to one of the big advertising managers in New York City complained to a friend recently that he had not been advanced during the last three years. This friend happened to know the assistant's superior, and at an advertising-club meeting casually asked him what progress the assistant had been making. "Funny thing," he replied, "that chap

looked to me like a live wire. Bright, industrious, careful, and all that; but the moment we loaded responsibility on his shoulders he fell down. Thought he knew enough. I can't seem to make him see that if he wants to go ahead he 'll have to study mighty hard. I had to do it, and I am still at it — I read every book on business subjects that can possibly help me. Why should n't he?"

A certain young business man well known to us, and one of the brightest we have met, began his bookstore in a small college-dormitory room and has now built up an annual trade of several thousand dollars. He has all sorts of up-to-date ideas, and is known among the college boys as a "live wire." But in his office is a shelf containing over thirty dollars' worth of business books; he is always on the lookout for a new one of any value; and he reads regularly the best business man's magazine published.

"You don't mean to tell us that a busy man can afford to spend the time to read all those books you are talking about?" a middle-aged man objected during an address by a successful business man.

"Personally," replied the speaker, "I am interested in reading to-day what men who do not read will be finding out ten years from now."

In a foot race, "getting the jump on the other fellow" is considered well worth while, often is the deciding factor in the race. How much more important it is in life's race, if it can be done, to get a ten-year jump on competitors.

It is sometimes lightly said of a book, "It 's worth its weight in gold." But of many vocational books listed in the following pages this is literally true. For instance, there is S. Roland Hall's little book, "How to Get a Position and How to Keep It." It costs 50 cents, but on a scalepan it would balance just 144 gold dollars, and the young man who could not make that much out of it should read it again. It is safe to say that its information if secured at

2997

sixteen will have made one's earnings $500 greater by the time one is thirty-six. And there are other books in these lists which perhaps will mean far more even than that. Do they not represent investments that are worth while?

Since this chapter has concerned itself with explanations and directions, it may be concluded without the usual exercises, readings, and references. You have doubtless come to see what sort of a study it is in which we are engaged and also something of how to use the text and the methods of securing supplementary information. The problems of life which we shall consider are real problems, and solving them demands ability. They will develop your power as a student, and in studying them you will have the added satisfaction of dealing with something of immense practical importance.

PART II

DETAILED STUDY OF THE MOST IMPORTANT LIFE VOCATIONS

CHAPTER IV

AGRICULTURE

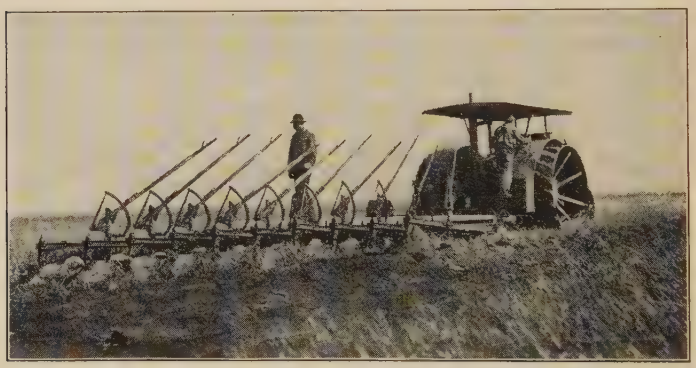
Look up! the wide extended plain
Is billowy with its ripened grain,
And on the summer winds are rolled
Its waves of emerald and gold. — WILLIAM H. BURLEIGH

When tillage begins, other arts follow. The farmers, therefore, are the founders of human civilization. —DANIEL WEBSTER

Agriculture and other occupations. If all the people of the United States were drawn up before you on one immense plain, three out of every ten would be farmers — and by the side of these farmers there would be enough other rural dwellers to equal the combined population of Chicago, Philadelphia, Saint Louis, and Boston. Upon the work done by these country people we are all dependent; for from them the miller gets his grain, the textile manufacturer his cotton and wool, the packer his cattle — in short, the necessities of life are largely a result of their daily toil. Agriculture is certainly of basic importance, both in its product and in number of workers. What persons in other occupations are doing fills so many columns in the daily papers that we are apt to forget that beyond

the roar of factories and crowded streets one third of all our people live on farms.

When these farmers set out to harvest a bumper crop, there is a movement of men and machines on a scale so big that not even the marshaling of great armies can rival it. The extra men hired for the annual wheat harvest alone number 860,000. The strength of both armies at Gettysburg was only 175,000 men. Both armies at Waterloo numbered 400,000 men. But over one million hired men are already



Plowing with a gas tractor

This powerful engine pulls ten plows and readily turns over as much as 30 acres of stubble per day. It is another sign of the American farmer's progressiveness

at work on the farms before they are joined by the extra harvesters, and the men who own or rent these farms number over two million more. This makes a total force annually in the harvest fields of 4,230,000 men. So agriculture, although carried on in the country, has more workers than any other occupation, whether of country or of city.

The immensity of one year's agricultural productions. The number of bushels in a year's crop is so incomprehensibly large that it has become merely a row of figures. The American cornfield alone is nearly as large as either

France or Germany, and the yield in 1914 was estimated at 2,676,000,000 bushels. From the wheat farms in the same year came 892,000,000 bushels, a golden stream which would make a river as wide as Fifth Avenue and five feet deep, reaching from Chicago to New York. Oats, barley, rye, rice, and buckwheat also were produced in enormous quantities. The Department of Agriculture in 1912 stated that "the total production of the seven cereals amounts to 5,609,807,000 bushels, a bulk of food so large as to be entirely beyond understanding."

If this grain were put into two-bushel sacks three feet long and sack after sack laid end to end, these sacks would go round the world sixty-three times — and there would be enough grain left over to make a row of sacks around the entire border of our country, from Maine to Washington, to California, to Florida, back to Maine again. And this is merely the *cereal* crop for *one* year.

Add to this the enormous productions of cotton, tobacco, flax, sugar. Consider also that the annual dairy products are worth about $800,000,000. Do not overlook the poultry industry either, for although an egg, when sold in hundred-dozen quantities, may be worth only a cent and three quarters, the 1,700,000,000 dozen eggs of 1912 totaled $350,000,000, and the use of poultry as food brought $220,000,000 more. It is by products such as these that the American farmer has taken from the soil and added to the national wealth billions of dollars. And a business of which such things as the foregoing are true deserves the consideration of young men.

Some attractions of rural life. But there are many additional reasons why agriculture may offer you a most attractive life work. The farmer, coöperating with nature from seeds sown in prepared soil and by careful cultivation until the harvest time, produces by far the most of mankind's food and clothing materials — the two great necessities of human life. While we might dispense with the telephone, the trolley, the

railroad, the factory, the department store, and the services of the various professions, we could not live at all without the food and clothing provided by the farmer. We see, therefore, that his services are fundamental and must always continue in demand.

We have all heard such expressions, or slogans, as "back to nature" and "the simple life," which mean that human beings cannot live healthy, happy, or complete lives amid the complexity of artificial city conditions as they could easily and naturally do in the country, close to God's great out of doors, and away from the confusion, competition, and confined quarters of the crowded centers. The simple life, near to nature's creatures, whether birds, cattle, pets, flowers, grain, fruit, vegetables, and under the elevating and enlarging influence of great stretches of landscape on all sides and of the limitless sky above — this simple living in childhood and youth has furnished our cities and our whole country with the largest part of their great men.

The varied qualifications demanded for agriculture. To work with living things, to see them grow and to help them develop into as nearly perfect creatures as possible, and to feel that one is producing and providing the necessities of human existence, such an occupation to a thoughtful person must be highly ennobling. To re-create poor or worthless fruit or vegetables into delicious, nourishing, and almost perfect specimens, to improve milch cows so that one animal can produce more cream than two or three formerly produced, to make two ears of corn grow where before only one grew, to transform thousands of square miles of desert land into highly productive farms, and to put into operation such marvelous labor-saving machines as the binder, the thresher, and the gas tractor — such are a few of the mighty works wrought by our agricultural specialists. Clearly, to be an expert in such profound and far-reaching activities requires natural ability, education, special training, and skill of the

highest order. Indeed, many of our most successful farmers to-day combine in one person the qualifications of scientist, engineer, and business man.

Therefore, if you enjoy simple fare, the open country, the brooks and woodlands, the meadows and the hills, the companionship of plant and animal life, and if you have a good quality of brain and brawn and executive ability, then farming in some of its many openings may suggest to you an attractive life-career.

THE GENERAL FARMER

By far the greater number of farmers have not specialized in growing any one of the particular products discussed in later pages under Specialized Farming, and hence they may be termed general farmers. In this section, while we shall have in mind primarily general farming in our discussion of the social advantages, of the nature of the occupation and its remuneration, and of starting and succeeding in agriculture, still much that we shall say will be equally true of the various forms of specialized farming. And since so many of our young people have a greatly mistaken notion of the farmer's social condition and advantages, we shall first of all discuss this important phase of his life work.

Social advantages. 1. *Improved transportation.* Although here and there we may find a few backwoodsmen to-day, the modern farmer no longer lives "forty miles from nowhere." Railroads have crisscrossed the continent until only on frontiers are homes far from sight of train or sound of whistle. Trolley lines in New England spread out like a spider's web; Ohio, Indiana, and Illinois are served by thousands of miles of track, and other states are witnessing a similar extension of trolley service.

Along railroad and trolley line may be found thousands of little villages, centers of the thought of the countryside

as well as markets for produce. Farmers can make trips to these villages more comfortably now than heretofore. The times are past when it took a whole day to drive the ox team and lumber wagon to town, and when getting stuck in a mudhole or breaking down on the bad roads was a frequent experience. Big, roomy spring wagons now carry most families to town. Top buggies are used by the young swains or the old folks. And in Minnesota more automobiles are owned by farmers than by villagers! In these trips to town there is much visiting, a social activity which may develop into a farmer's grange; and much bargaining, which often ripens into a coöperative grain elevator, store, or creamery. Longer trips than to the village may include picnics, reunions, carnivals, county and state fairs, and, occasionally, an exposition or a visit to the old home. These things broaden the farmer's horizon.

2. *Communication by telephone and rural free delivery.* But even on his farm the rural dweller may be linked with the world. One of the ways of doing this is to have a rural telephone. There is a sense of community life in knowing that you can talk readily with your neighbors. In Iowa, for example, no farmer can very well feel "out of the world" when the number of telephones is about the same as the number of farms. A recent United States census report on the telephone makes the following statement:

> In many parts of the country at a certain prearranged signal, such as two long rings, everyone on the farm lines goes to the telephone; and when central is assured that practically everybody is on the line, she reads out any important matters of general news which may have come in during the day, and also gives out the weather report. In this way, throughout large stretches of the country the farmer is better informed as to the events of the day than the busy city resident whose reading of the morning paper consists of a glance at the headlines over his coffee.

The farmers are reading, too. Rural free delivery is spreading so rapidly that there are now more than 40,000 routes over which mail is daily taken to those living in the

country. By 1903 this rural mail service had increased the amount of United States mail handled by 40 per cent. In addition to the local paper, metropolitan dailies and agricultural magazines are subscribed for and carefully read. Both the state and the national departments of agriculture send out bulletins. In 1902 the Department at Washington sent out 2,000,000 of these bulletins; by 1912 the demand had increased over five times. If the sheets of farmers' bulletins sent out from Washington during the three years 1910–1912 were laid edge to edge, they would make a sidewalk 4 feet wide, down which you could walk 20 miles every day for a whole year and still have it stretching out before you for 2300 miles. Surely an immense amount of reading is being done on farm subjects.

3. *Improvement of social advantages.* While the social advantages enjoyed by the farmer are constantly improving, it should be added that they depend quite largely upon the particular community and the particular man. If the community is stagnating, the soil poor, coöperation dead, and the farmer, like his community, slovenly and ignorant, then, of course, his social condition will be decidedly inferior to that enjoyed everywhere by thriving, up-to-date people in other occupations. But even such drawbacks as these can in many cases be improved, and in hundreds of instances so prosperous is the community and so successful is the farmer that he occupies a position of high social esteem in his county, and very often is a respected state and national figure.

Nature of the occupation and its remuneration. 1. *Independence without large means.* In the first place, the farmer is independent. If he is at all successful, he is never troubled with sheriff's writs of attachment. There are no violent changes in prices with disastrous panics. He has no competitor trying to get his position away from him. When he becomes old he does not live in constant dread of the day when he will be

called into the general manager's office and told, "I am very sorry, but we shall have to put a younger man in your place."

His expenses, moreover, need not be high even though he lives well. A garden, an orchard, a few chickens, some pigs, a cow or two, and his food is practically all raised at home. If his wife and daughters are good cooks, his table may have food whose liberal quantity, variety, and wholesomeness are denied many city dwellers much more wealthy than he. Fresh eggs and vegetables, chicken and strawberries, delicacies to the city man, may all be his, and are his in thousands of cases.

He lives, for the most part, among his equals. Very few immigrants — in 1900 there were only 85 foreign-born per thousand white farm laborers in the United States — menace his standard of living. Very few idle rich rouse his envy. Naturally, since our farmers are so fortunately situated, they form the democratic ballast of our country.

2. *Lightening the hard work of the farm.* The hard work of the farmer can be lightened, and is being lightened, by labor-saving machinery. In the last sixty years, for instance, there have been continual improvements in corn-growing machinery. The amount of work demanded of human muscles has been steadily cut down.

> This was because inventors [says George K. Holmes[1]] had given to the farmers the gang plow, the disk harrow, the corn planter drawn by horses, and the four-section harrow for pulverizing the topsoil; because they had given to the farmer the self-binder drawn by horses to cut the stalks and bind them; a machine for removing the husks from the ears and in the same operation for cutting the husks, stalks, and blades for feeding, the power being supplied by a steam engine; because they had given to the farmer a marvelous corn sheller, operated by steam and shelling 1 bushel of corn per minute instead of the old way of corn shelling in which the labor of one man was required for one hundred minutes to do the same work.

The result of this labor-saving machinery has been that whereas the farmer of 1855 had to work on an average a

[1] Yearbook, United States Department of Agriculture, 1910.

total of four hours and thirty-four minutes to raise 1 bushel of corn, the farmer of 1894 could produce it in forty-one minutes of labor.

In raising wheat, likewise, an even greater saving of labor has been reached. It took on an average a total of three hours and three minutes for the farmer of 1830 to produce 1 bushel of wheat; the farmer of 1894 could do it in ten minutes. How? "The heavy, clumsy plow of 1830 had given way to the disk plow that both plowed and pulverized the soil

Harvesting grain with a binder

The self-binder is rightly regarded as one of the world's great inventions. It has done more than any other one machine to save labor on the farm and cheapen the cost of our bread

in the same operation; hand sowing had been displaced by the mechanical seeder drawn by horses; the cradling and thrashing with flails and hand winnowing had given way to reaping, thrashing, and sacking with the combined reaper and thrasher drawn by horses." Iron and steel do not tire like muscles, and horses are cheaper than men. Rural life need not stagnate under the burden of labor. A man may be a farmer and advance intellectually.

3. *Increasing the yield per acre and diversified farming.* The number of bushels, and consequently of dollars, per acre

can also be increased. In the medieval ages the average yield of grain was only 6 or 8 bushels an acre. Walter of Henley, who lived in the thirteenth century, said that "threefold the seed was an average harvest, and that often a man was lucky to get back his seed corn and as much again." But the present American yield is from two to three times this medieval yield. And our most successful farmers do not feel satisfied unless they receive at least fifteen times their seed. There are farmers, too, who prove year after year that the average yield of American farmers is a very low average indeed. While agricultural science has had a wonderful development during the last twenty-five years, our experts tell us that much greater results are still ahead of us. There is such a thing as mixing brains with the soil — and growing more dollars.

Closely related to this increase in the yield per acre is diversified farming. No wide-awake farmer to-day raises only wheat, or corn, or rye. He grows some of each of these, but in addition he raises numerous other products, such as hay, potatoes, vegetables, live stock, poultry, bees, etc. Some special consideration will be given several of these products in later pages under Specialized Farming.

4. *Other ways of increasing profits.* The farmer may increase his profits in two other ways: One is by cutting down the marketing expense. There is considerable difference between the selling price of wheat, corn, and other products in the city market and on the farm. This expense may be reduced and the farmer made more prosperous in three ways: (*a*) Securing better roads. The Department of Agriculture estimates that hauling a bushel of grain to town costs almost five and a half cents and getting cotton from the plantation to the local shipping point 16 cents per hundred pounds. Think what a saving it would be if by better roads the same team of horses or mules could haul twice as big a load! (*b*) Holding his products for better prices. The farmer is too often forced to sell his crops as soon as harvested for whatever

he is offered. Ready money for running expenses or better credit arrangements would help him a great deal in being able to sell his products when prices were higher. (*c*) Joining with his brother farmers in a selling association — as is often done by the fruit growers — and securing favorable rates and commissions. Better prices will be secured when the farmer is not obliged to drag his products over miserable roads and take at once whatever he may be offered for them. By these three plans, in which great progress is now being made, the farmer becomes a better marketer.

A second way in which the farmer gets richer is by the increase in the value of his farm. In the ten years from 1900 to 1910 farm lands rose in value from $15 to $32 per acre. The man who owns a quarter section may thus, even though he be a poor farmer and hardly able to make both ends meet, become richer every year and, eventually, perhaps well-to-do.

It seems to be clear, consequently, that if you become a farmer you enter a calling in which the man of ability has an increasingly good opportunity to advance. There are farmers in the great Northwest, for instance, who, beginning with scarcely a dollar, now have farms so large that a single crop from one of their wheat fields would provide about 20,000,000 loaves of bread — enough to give every man, woman, and child in Belgium three loaves apiece.

Starting and succeeding in agriculture. 1. *Possibilities of earning a farm.* Let us suppose that you are an able-bodied young man of twenty. Can you earn a farm? During the harvest season on the farm — this comes in vacation time, and it is certainly good experience for any boy to hire out for the summer to an up-to-date farmer — wages (including board and lodging) are about $2 a day in the West, not much more than half that in the South, and about 25 cents less than that in the East and Middle West. If you work as a hired hand all the year round, the monthly rate is from $20 to $30. While this may not seem like

high wages, it includes board, lodging, and laundry, and your other necessary expenses, such as clothing, are not a serious item. If the farm laborer is married, with the lower rent in the country and a garden on which to produce much of his food, he receives a larger actual wage at $30 a month than the motorman or street-car conductor in the city at a salary nominally much higher. Nevertheless, the prospects of saving enough for a good farm on a $30-a-month salary alone would not be particularly encouraging.

Other ways are open. Many young men work for awhile as farm laborers, learn all they can, save every dollar possible, and then begin as tenants. After farming for a few years and giving the owner a share of the crops or paying him a cash rental, they have laid by enough to purchase a small farm of their own. They may, however, buy it after having saved only a part of its cost, the remainder of the selling price being secured to its former owner by a mortgage on the farm. The United States Department of Agriculture made an investigation several years ago, in which their correspondents were asked whether it was reasonably possible for farm laborers and tenants to save enough to buy a farm that would support a family even with the help of a mortgage, and the replies indicated that 72 per cent of farm laborers and tenants find it reasonably easy to acquire farm ownership. The percentages for the different geographic divisions of the United States were all between 70 and 80 — a remarkably uniform condition of affairs when the whole country is under consideration.

Perhaps you now live in a town or small city and already have some capital. If you know nothing of farming, it is wise to go slowly. Do not be led astray by stories of wonderful opportunities "way off somewhere." The chances are ten to one that there are better opportunities near you. Nor should you invest all your money in land. Remember that there are other things to buy, such as buildings, machinery,

and live stock, and that the running expenses must be provided for until the crops are harvested. Be cautious. Spend less than you would like to on machinery. Do not try to have a fully equipped farm from the start, but make it pay for its improvements as you go along.

2. *Education and training required.* While it is true that most farmers in the past have had only a common-school education, this is no argument for such a limited training now. On the other hand, we find many of our most successful

A trained farmer at work

This man understands machinery, soil, crops, and markets. He is a graduate of an agricultural college and knows how to make farming both profitable and pleasant

young farmers to-day combining in one person the qualifications of scientist, engineer, and business man. Such extensive qualifications as these require a liberal education, including considerable training in agricultural and business subjects. Without question, if a prospective farmer can make the necessary arrangements, he should complete a four-year college course in agriculture. At any rate he ought not to consider himself adequately prepared for farming until he has taken at least a four-year agricultural and business course in his local or county high school.

The traditional high school as a rule does not prepare boys for a successful career on the farm. So fully has it been realized that the average course in high school, and college as well, does not meet the needs of young farmers that the last few years have witnessed a tremendous movement for agricultural education. While eighteen years ago not one public high school taught agriculture, now over two thousand schools are teaching it. In 1897 there were only seventy institutions of any sort teaching this subject. In 1912 the number of state and private colleges, public and private agricultural schools, and public and private high schools in which agriculture was taught numbered two thousand six hundred. In two years this number of agricultural-teaching schools had increased three times. Now over thirty states permit or require instruction in agriculture in their public schools. In about half as many states the law requires that it shall be taught in the elementary schools. In Nebraska, for example, no teacher for the last ten years has been able to secure either a first-grade or a second-grade certificate unless prepared to teach the elementary principles of agriculture. A number of excellent textbooks have been published, and an earnest effort is being made to convince the country boy that he does not leave practical life behind when he enters the little white schoolhouse.

3. *Ways of securing a knowledge of successful farming.* So if you are planning to be a successful farmer we advise you while in the high school to read some of the interesting little textbooks that are used in the elementary schools. Complete the agricultural course in your local high school, if such a course is offered. Better yet, attend the nearest agricultural county high school. There you will hear lectures on soils, seeds, crops, live-stock judging, dairying, fruit raising, farm mechanics, etc., which, with the demonstrations, discussions, readings, and laboratory work, will help you to become a prosperous farmer. Be sure to join one or more

of the boys' agricultural clubs that are springing up all over our country, such as the corn, the potato, the gardening and canning, the dairy, and the poultry clubs. These organizations are for the most part under the direction of the state and federal agricultural departments and are doing a wonderfully interesting and helpful work. We should perhaps add that there are decided advantages to be gained in competing for prizes offered to members of agricultural clubs rather than for those to be won at county fairs, because in the case of the clubs a boy is competing with other boys and girls and not with experienced farmers, and also because many helpful directions and much instruction are freely furnished all competing club members.

Graduated from high school, do not rest content with the advantages just mentioned. Some winter — the sooner the better — attend the short course at your state agricultural college. There you will meet boys from all over the state, and professors who know agriculture thoroughly. It will not cost you very much; it occupies the six to eight weeks of the slack winter season, and it will be one of the best investments you ever made. Or, better still, if you want to reach the top notch in scientific agriculture, enroll at your state agricultural college for the four-year course. Write beforehand to the president of the college asking him for a catalogue. Look the course of study through, and see how all the tough farm problems that you never could straighten out alone are here presented by experts. Bear in mind, too, when you come to finish the course that one of the criticisms passed upon the agricultural college is that its graduates are usually men too valuable to go back to running ordinary farms, but secure better positions as managers of large farms, creameries, or experimental stations. It means considerable for any young man to have such a practical, much-in-demand education as this.

4. *Adding to your success.* In whatever way you get your education, once on the farm do not go to seed

mentally. Keep on growing. Subscribe for several first-class agricultural papers. These periodicals are numerous, and many of them can be depended upon as fully reliable. The references on pages 63–65 list several good papers. Subscribe for a year, or if in doubt as to whether they will meet your needs, write to the publishers for sample copies. Good books, too, are abundant. Is it not absurd to keep on making the same costly mistakes year after year and perhaps worrying a great deal as to what can be done about it, in many cases losing hundreds of dollars and suffering an amount of dissatisfaction which can never be counted up, when the whole difficulty could be solved by a $1.25 book? Authors of such books have faced successfully the same problems that confront you; they have written down the answers, and it is a mistake not to let them help you when you are in trouble.

In every state there is an agricultural experiment station. Write to the one in your state, asking to have your name placed on the mailing list for all the bulletins they publish. The United States Secretary of Agriculture will mail you on request a list which tells what subjects are treated. There will certainly be several that will interest you. You can then send for the ones you desire, and they will be mailed you free. Keep your eyes open for new information from any source. Attend farmers' institutes. The speakers will have something of value for you even after you have become an experienced farmer. If a "seed-corn special," an agricultural lecturer, or a dairy demonstrator is booked for your village, be on hand. While you may not agree with all that is said, you will surely hear something that you can use with profit.

When in doubt, write your troubles to the principal of the nearest agricultural high school, the editor of your farm paper, the director of the state experiment station, the president of the state agricultural college, or the secretary of the United States Department of Agriculture. Is it not effort

thrown away to keep on working so hard in the broiling sun trying to raise a bumper crop of corn when a short letter to the state agricultural college asking about seed corn, for instance, might increase the yield more than ten days' extra toil with the cultivator? The farmer who gets ahead mixes brains with the soil. He will get ahead faster if he improves his mixture by drawing in from the outside some superior brains. If the county, the state, and the United States governments are paying salaries to experts, who are anxious to help you free of charge, why not let them do it? You will certainly be the gainer.

The question, How can one enter and make a success of agriculture? can be answered in a number of practical ways. The young man with the proper qualifications can become the owner of a farm, and the farmer who pushes his business can succeed. In the sections on Specialized Farming that follow, much additional light will be thrown upon this vital question.

EXERCISES

1. Talk with a successful general farmer in your community. How many acres has his farm? What is the value per acre? the value of the improvements? of the live stock? What are his most paying crops? How much are his gross receipts during a year? What are his net profits? What particular points about his farm impress you most favorably?

2. Talk with some rural mail carrier. How many papers are his farmers reading? What sort of papers? Is the amount and quality of this reading material increasing or decreasing?

3. Mention some ways in which the parcel post is benefiting the farmer.

4. Describe some farming community that you believe is thoroughly progressive. What schools has it? What social features? Is there any coöperation among the farmers in work? in selling their products?

5. Will the condition of the Eastern farmer be made better or worse by the disappearance of free land in the West?

6. Diversified farming has what effect on soil fertility? on the seasonable demand for labor?

7. Describe the general appearance of some farm that seems successful. What conveniences are to be found in the house?

8. Is your region well adapted for general farming? In what way can you become a general farmer?

9. What disadvantages of farm life seem to you the worst? How can they be overcome?

10. What advantages of farm life appeal most to you? How can these be increased?

SPECIALIZED FARMING

There are several lines of specialized farming that you should know about, since any one of them may be developed into a substantial business. The general farmer, as was mentioned before, does not devote his entire attention nowadays to any one crop, but practices, to some extent at least, diversified farming. He may find, for instance, that he takes more interest in fine milch cows than in anything else on the farm and thus he gradually becomes a dairyman; or he may plant a part of his farm to apples and peaches instead of wheat and to this extent become a horticulturist. Or while the father continues to run the farm the son may take charge of the bees and develop into a practical bee-keeper; or he may give his attention to chickens and eggs and thus become the poultryman of the family. A third and more common way in which people come to take up some form of specialized farming is by discovering that this particular branch of farming can be best adjusted to their needs or limitations. Is your capital small? Then do not attempt wheat farming in the Dakotas; raising vegetables on a two-acre plot near some city would be better suited to your purse. Are you unable to do hard physical work? Do not buy a quarter-section corn farm in Missouri; perhaps caring

for several rows of beehives would be just adapted to your strength. Do you like a warm, dry climate? Then do not become a cotton planter in Louisiana; try the orange industry in southern California.

Several of these openings will be described briefly. Think over the various lines of farming and decide which interests you most. If you believe you would like gardening, subscribe for one of the gardening magazines or read some of

Cutting and threshing wheat in Oregon

These great machines are not so common as they once were in the West. The 10,000-acre grain fields are giving way to diversified farming, with better profits per acre and homes for more people

the books on the subject. Visit some of the gardens near at hand. In this way you may get into just what suits you.

The stockman. The stockman is a farmer who raises cattle, horses, mules, and sheep for the market. There has always been a steady demand for his products, particularly for the last ten years, during which time their aggregate value has increased 56 per cent. Not in all states, however, can they be raised profitably. Considerable space is required for the animals to range over, and in some sections land is

too expensive to permit this. The great range country is west of the Mississippi; while the great corn-growing region, where cattle are fattened before shipment to the stockyards, is the north Mississippi valley. Consequently New England has only 2 per cent of the cattle, — these being chiefly dairy cattle, — while the states leading in value of live stock are Iowa, Texas, Illinois, Missouri, Kansas, and Nebraska, in the order named.

The usual scenes of cowboy life shown in the motion-picture shows are rarely true of the stockman to-day. He is more a farmer than a bronco-busting cowboy. Still, the life is a vigorous, out-of-door one, and the young man who is naturally a good judge of live stock and lives in the proper region should certainly take up stock raising in connection with his general farming. However, should he desire real ranch life and nothing else, he must go into certain parts of Wyoming, South Dakota, Montana, Oklahoma, or Texas. There he can get work almost any summer putting up hay, and if he stays long enough he may eventually be called upon to rope a few steers.

EXERCISES

1. Why are the great stock ranges being pushed into the mountain states? Why are they steadily becoming smaller?

2. Describe the life on a typical Western cattle ranch. (See article by Theodore Roosevelt in the *Outlook*, May 24, 1913, pp. 148–171.)

3. Find out from your local butcher where he gets his meat.

4. Trace a beef steer from its home range until it reaches your local market.

5. Would raising beef cattle be profitable near where you live?

6. What are some of the best breeds of beef cattle? of sheep?

7. Does it pay a farmer in your county to raise a few colts each year? to keep a few sheep?

The dairyman. The dairy business, unlike stock raising, flourishes best near the great cities. New York leads all states in the number of dairy cows. New England, its small size

considered, has almost twice as many cows as other parts of the United States. Should you plan to sell fresh milk and cream, care should be taken to locate either within driving distance of a good market or near a railroad or trolley line. The dairying business can be carried on profitably, however, at a distance from consumers. In this case you can sell milk to the condensed-milk companies or make the cream, though sour, into butter either at home or in coöperative creameries, or turn it over to local agents of the big creameries which are, perhaps, two or three hundred miles away.

A dairy farm

This dairyman keeps only choice blooded stock in his herd. Twice each day the milk is taken by automobile to the local station, where it is shipped by express to the city

1. *Advantages of scientific testing of milch cows.* Dairy cows vary in cost from $30 to over $100, their value depending chiefly upon the richness and amount of their milk. The past few years have shown great strides in the scientific testing and evaluation of milch cows. At times it has been found that a large proportion of cows did not pay for their feed, to say nothing of yielding a profit. Consequently our wide-awake farmers are removing these low-standard cows as rapidly as possible and are filling their places with high-grade milkers, so as to make every cow in their dairies a

unit of profit. The number of cows that dairy farmers keep runs all the way from eight or ten to as high as one hundred and fifty or two hundred. Fewer than sixteen cows, unless you have other work, would not be enough to keep you busy and to make a profitable business. In New England the dairyman has for every cow from one to three acres of pasture, with varying amounts of tillable land. With a good system of crop rotation, the soil fertility of his farm may be kept up year after year.

The work on a dairy farm is exacting, but it is not particularly hard physically and is very satisfying to one who loves good animals. For the young man who studies his business, replaces poor cows with high-bred ones, and develops his dairy along modern sanitary lines the outlook is good. The first-class dairyman has long suffered because consumers could not readily tell his product from inferior milk. But under a better system of testing milk, inspection of dairy farms, and licensing, the high-grade dairyman is getting his proper returns. People are learning that "milk is milk" does not hold true when part of it is water and part dirt, and they will pay a higher price per quart for superior milk and buy more of it.

2. *Occupations in creameries and related lines of business.* There are also many openings for young men in every department of the creamery business and related lines, such as cheese making, ice-cream making, and city milk stations. Some of the positions are those of butter maker and helper in creamery, factory manager, butter buyer, and traveling salesman for dairy products. Good butter makers receive from $60 to $125 per month, and there are numerous attractive features to this work. "The country boy," says the editor of the *Butter, Cheese, and Egg Journal*, "often gets a place to work as helper in the local creamery, where he gets his first training in butter making and in keeping things scrupulously clean. After he has saved some money, he may take the

winter course for three months [in the nearest agricultural college] and thus fit himself to run a creamery or cheese factory for himself. If he can show himself industrious and reliable in a small factory, his advance to positions of more responsibility in larger factories is assured."

EXERCISES

1. Why have people come to appreciate as never before the value of good milk? What laws and ordinances regulate the dairy business in your town?

2. Is dairying well adapted to your particular locality?

3. Interview some dairyman. How many cows has he? How many acres of pasture? of tilled land? What is the total amount he has invested? What are his annual profits? In what ways could his business be improved and made more profitable?

4. What is the difference between the beef type and the dairy type of cow?

5. What are some of the best dairy breeds?

6. How can you find out on which cows your greatest profits are made? How could you use this information to advantage?

7. What are the local opportunities for employment in the creamery business and related lines?

The poultryman. 1. *The enormous value of poultry products.* The value of the poultry found on the farms by the census enumerators in 1910, if expressed in dollar bills and these laid end to end, would make a row of greenbacks reaching from New York to Boston thirty-six times, to New Orleans four times, plus a string of bills across the continent to San Francisco and reaching as far back again as Chicago. During 1909 a billion and a half of eggs were received in the city of New York alone. The Secretary of Agriculture says in his 1908 report that "the eggs and poultry produced on the farms are worth as much as the hay crop or the wheat crop," an amount of some $620,000,000!

The majority of the eggs are produced in the Mississippi valley, not by professional poultrymen but by farmers to whom the business is incidental. These farmers in general pay little attention to the careful handling of eggs. The rural buyer for the commission merchants in most cases offers the same price for good and bad alike. Since the distance these eggs

A poultry farm

The number of chickens and the amount of equipment shown in this picture indicate that lack of capital need not long deter a young man from becoming owner of such a farm

are shipped is often great, the time before they are consumed adds another difficulty. In Kansas alone the loss on spoiled eggs amounts to 14 per cent of the price paid the farmer. The total loss on bad eggs each year in the United States is $45,000,000. Consumers, too, are "afraid" of eggs, and would eat more of them and willingly pay larger prices if certain of procuring fresh ones.

2. *The opportunities of the scientific poultryman.* This incidental production and careless marketing of eggs by the general farmer gives the professional poultryman an opening. His usual location is either in the far East or the far West, but a first-class market can be developed near any large city. A fancy price and a steady demand are assured whenever consumers learn that they can depend upon "strictly fresh" eggs, that are never anything but what this phrase implies. Some poultrymen enter into profitable contracts with commission men supplying a fancy trade, or with hotels and restaurants catering to the better class of diners. To one who wants to specialize in raising poultry for meat a different breed of hen is desirable, although there are several admirable breeds equally good for egg production or meat purposes.

While the work is light, it requires careful attention to details. The capital needed is small; in fact, a start can be made on a small lot and with a limited equipment. The profits in many cases are splendid, and a steady income is assured any young man who makes a moderate success of this business.

EXERCISES

1. How do eggs compare with beef in nutritive value? in digestibility? (See *Farmers' Bulletin 142.*)

2. How can the price of eggs in general be raised? (See Yearbook for 1910, pp. 461–476; for 1911, pp. 467–478.)

3. How can you learn which of the hens in your flock are the best layers?

4. How are eggs tested and graded? Should they be sold by the dozen or by the pound?

5. If the markets are distant, how can one carry on a profitable poultry business? (See Yearbook for 1912, pp. 285–292.)

6. Interview some poultryman. How many hens has he? What breeds? How much equipment has he? What expenses does he have to meet? Does he find raising hens for eggs or for meat more profitable? In what way do you think his business might be improved?

Market gardening. The vegetables you see on sale early in the spring probably come from the lower Atlantic coast, a great winter garden stretching from Savannah, Georgia, to the southern section of New Jersey. Often $500 worth of berries are grown on an acre of this land, while yields of $1000 per acre are by no means unknown, and near Wilmington, North Carolina, one grower harvested from a half acre lettuce to the value of $1756. Only approximately 1 per cent of the land available is now under truck cultivation, and the unprepared land can be bought for about $10 per acre.

1. *Making the garden and growing the vegetables.* Many gardeners have laid the foundations of their future careers by helping their mothers till the back yard at home. They enjoyed working with the potatoes, cabbages, onions, asparagus, tomatoes, cucumbers, and melons and seeing them grow from tiny seedlings to maturity. So they searched out a little plot of ground and commenced. It does not take a great deal of money to set up in business as a market gardener. A vacant lot is enough for a start and an acre or two will supply all the work you can do for a time.

The garden should be laid out so that the necessary work can be done easily. No raised beds need be tried, since they take too much time and labor and waste moisture. Instead, after seeing that the soil is rich and well prepared, plant the vegetables in long rows so that the tilling can be done with wheel tools. Some artificial means for supplying water may work wonders with your garden even though the farmers around you never consider irrigation.

2. *Marketing the products.* Pack your vegetables when marketable in neat, small packages or baskets. Never disappoint your customers when they have ordered of you, and be careful that vegetables from your garden reach them in a clean, bright, fresh condition. Keep your market wagon painted and washed so that it will be attractive. A bright,

clean wagon inspires confidence and goes a long way toward making people feel that they are dealing with a successful young man.

Unless you deliver the vegetables directly to consumers — which is impossible for most gardeners not doing a local business — the question of marketing is more serious. In fact, it is generally easier to grow vegetables than to market them successfully. Shipments go through a number of hands — transportation companies, draymen, commission merchants, jobbers, and retail dealers — before they reach the consumer, in each case additional time being consumed; and vegetables are perishable. Each middleman, also, charges for his services; so that the difference between what the consumer pays and what the grower gets becomes larger and larger. It is estimated by the Department of Agriculture that in the case of vegetables the producer receives only about one third of the price paid by the consumer.

EXERCISES

1. If you should take up market gardening where you live, would you be likely to have Japanese, Chinese, or Italian competitors? Could they raise fruit and vegetables more cheaply than you?

2. Of what importance is good seed? What are some of the leading seed companies?

3. In what ways can you get vegetables on the market early in the season?

4. Talk with your vegetable grower. How much land has he? How does he keep it in good condition? How does he cultivate? What additional vegetables or varieties might he raise with profit? What arrangements for marketing has he? Could he cut down expenses in marketing? How?

5. Call upon your vegetable dealer, or your grocer if he handles vegetables. How much does he have invested in vegetables at any one time? How often does he turn his stock? Where does he get his vegetables? From what distances does he sometimes have them shipped? What per cent does he estimate is waste?

6. If you approached a city hotel manager with the proposition to supply him fresh vegetables, what arguments would you use to get his permanent trade?

7. Could you develop standardized baskets of vegetables at 25 cents, 50 cents, and 75 cents, which housewives would come to know, depend upon, and order by telephone? Ask your mother what different vegetables and what proportions of each should be placed in such family baskets.

The fruit grower. A good way to test yourself as a fruit grower is to begin on your home plot. If you have but little space, plant a row or two of strawberries, currants, blackberries, or gooseberries along the back-yard fence. You may have enough room for a grapevine, besides, and perhaps a peach tree or two. Or your plot may be large; then see what you can do with apples, pears, or cherries. Here, of course, you must wait longer before getting any fruit. Set out first-class nursery stock, which costs so little more that it is effort wasted to begin with poor trees. Cultivate the young trees well, thinking not merely of the few small trees in front of you, but of the hundreds of heavily laden trees you may have to take charge of later on. Should your efforts succeed, plan to develop your business on a larger scale.

1. *Conditions for successful fruit growing.* First of all you will find two things of great importance. The climate and the soil, for best results, must be suited to the particular fruit. "Apples thrive best," says Professor L. R. Taft, "on a strong, sandy loam soil, or a light clay loam. Pears require a rather stiff soil, and do best in a moderately heavy clay loam. Currants delight in a cool, moist soil, and cannot be grown successfully in the Southern States. Oranges, lemons, and figs are adapted to many sections of California, Florida, and Louisiana, but can only be grown under glass in the northern states." Your own knowledge, the experience of your neighbors, and the advice of the state experiment stations and the United States Department of Agriculture will guide you in selecting the fruits best adapted to your soil and climate.

It may be added that it is possible to modify somewhat both soil and climate. A hill, a north or south slope, a table-land, or a valley may be selected. This land may be drained, surface-worked in the usual way, or irrigated. It may be stated further that the various insect enemies about which there is so much talk need not unduly alarm you. They can all be conquered. But if you are new at the business do not invest your money in a fruit farm before giving these various matters full consideration.

2. *Marketing the products.* While you are studying soil, climate, what particular fruits to grow, and insect enemies, you must also think of another very important matter — the market. As in the case of market gardening, it is often easier to produce the fruit than to sell it satisfactorily. If you have gone into the raising of small fruits, such as raspberries, dewberries, currants, and strawberries, quickness of transportation and sale is essential, since these fruits do not stand up like apples or oranges. Truly surprising results in marketing are accomplished by the orange and grape growers of southern California, the peach growers of Colorado, and the apple growers of Oregon and Washington. The bulk of their product finds a market in the Eastern states, three thousand miles away, across lofty mountain ranges and wide deserts. It has been only by careful attention to packing, the development of the refrigerator car, and the guidance of coöperative fruit-growers' associations that this business, depending for its customers upon the opposite side of the continent, could be so successfully carried on. The fact that these details have been worked out and a business of millions of dollars developed should be an encouragement to all fruit growers.

EXERCISES

1. Write, asking information regarding their fruit industry, cost of land, returns per acre, etc. to the following chambers of commerce: Grand Junction, Colorado; Fresno, California; Portland, Oregon; Middletown, Connecticut; Athens, Georgia.

2. Why has the coöperative movement been developed among the fruit growers in the West? What are its advantages? What dangers threaten it? (See Yearbook for 1910, pp. 391–406.)

3. What fruits grow best in your neighborhood?

4. Visit some successful fruit grower. How much has he invested in land? What do his trees cost him? On what crops does he make most profit? What marketing arrangements has he?

5. Call upon your local fruit dealer. Where does he secure his fruit? How long is it in transit? What percentage is waste?

6. From what nurserymen do your fruit growers buy their stock? Are they satisfied with it?

7. With the raising of what other products may fruit growing be profitably combined?

OTHER AGRICULTURAL OCCUPATIONS

Nurseryman. There are various other openings in agriculture, some one of which may prove very attractive to you. If you find fruit growing to your liking, you may turn your attention to producing young trees for other farmers. By adding numerous kinds of trees and shrubs, you may become a nurseryman. If you should desire first to learn how to care for young trees, you might later secure a position with some well-established nursery firm. Or you may be interested in the selling end of the business first, and after being a traveling agent for a time, finally take a partnership in the firm.

Seedsman. Somewhat similar to the vocation of nurseryman is that of seedsman. It should be the ambition of every farmer to grow and select good seed, yet no general farmer or even a market gardener can afford to spend the time and effort required to develop new varieties of plants and produce numerous kinds of seeds. This is the work of a specialist, the seedsman; and certain firms, whose names on the little seed envelopes may be familiar to you, have made of it a successful business.

Landscape gardener; floriculturist. Another opening — one of the newer professions — is that of landscape gardener. The number of openings available at present are small but increasing, and the salaries are good. Again, you may love flowers, and being a floriculturist would most likely interest you. It would mean taking care of or directing the care of flowers in parks and private grounds or in greenhouses.

Beekeeper. But little capital is required to begin as a beekeeper. Two hives of bees and a limited equipment will do at the start, and if handled well they will themselves pay for whatever else is needed.

Swine raiser. It is hard to imagine any successful general farmer who is not also something of a swine raiser. Not much land is required, but hogs have tremendous appetites, and to solve the problem of food supply usually calls for large corn acreage.

Other positions. If you are well trained and able to run a farm with success, positions are to be had as farm manager, with salary ranging from $600 to $2000 per year. The large number of agricultural high schools and colleges, almost three thousand of them, demand trained teachers. The position as agricultural teacher pays well as compared with other teaching positions. And last of the miscellaneous openings in agriculture that we shall mention is government work. "There is a very strong and steady demand for young men trained in the principles of agriculture," Professor E. C. Bishop of the Iowa State College writes us, "to direct the government and state work in surveying, forestry, irrigation, drainage, to serve as county advisers in the United States Farm Management Demonstration Work, and to take charge of other lines where a knowledge of the principles of agriculture is needed to direct the various lines of agricultural practice which the state and government are now so vigorously and effectively pushing." Here is a line of work which, moreover, is certain to grow in importance.

CONCLUDING SUGGESTIONS TO PROSPECTIVE FARMERS

It takes a bigger man to-day than it ever did before to run a farm successfully. It has not been many years since a pioneer could pick out one hundred and sixty acres of the most fertile land in the Mississippi valley and get it free from the government for the asking. A man of very ordinary push and brain could get along under such favorable conditions. But for some time land has been steadily rising in price, until in Iowa, for instance, $150 an acre is frequently charged for an improved farm. Besides horses, hogs, cattle, and chickens, considerable machinery must be owned. To manage profitably all these in combination demands good hard sense, special training, and executive ability.

On the other hand, only about half the farm area available has yet been improved. Scientific agriculture is making more and more a profit on cheap poor land as well as on high-priced good land. Thousands of fine openings in specialized agriculture await the man who is alert enough to see them. In fact, the young man whose interest is in agriculture need not be discouraged, but should rather be optimistic because of the new demands under which success comes to him who is industrious, experienced, and scientifically trained.

READINGS AND REFERENCES

Books

Bailey, L. H. The Country-Life Movement in the United States. The Macmillan Company, New York. $1.25.

Bailey, L. H. The Nursery-Book. The Macmillan Company, New York. $1.00.

Burkett, C. W. The Farmers' Veterinarian. Orange Judd Company, New York. $1.50.

Burkett, Stevens, and Hill. Agriculture for Beginners. Ginn and Company, Boston. 90 cents.

CORBETT, L. C. Garden Farming. Ginn and Company, Boston.
DELANCEY, F. W. Down-to-date Poultry Knowledge. Poultry Fancier Publishing Company, Sellersville, Pennsylvania. 50 cents.
HENDERSON, PETER. Practical Floriculture. Orange Judd Company, New York. $1.50.
HUEBNER, GROVER G. Agricultural Commerce. D. Appleton and Company. $2.00.
HUNT, T. F. The Young Farmer. Orange Judd Company, New York. $1.50.
NEWMAN, T. G., and DADANT, C. P. "First Lessons in Bee-Keeping." *American Bee Journal*, Hamilton, Illinois. 50 cents.
PLUMB, C. S. Types and Breeds of Farm Animals. Ginn and Company, Boston. $2.00.
ROBINSON, JOHN. Our Domestic Birds. Ginn and Company, Boston. $1.35.
TRACY, SR., W. W. Vegetable Seed Growing as a Business. Yearbook for 1909, pp. 273–284.
VAN NORMAN, H. E. First Lessons in Dairying. Orange Judd Company, New York. 50 cents.
WATERS, H. J. Essentials of Agriculture. Ginn and Company, Boston. $1.25.
WATSON, G. C. Farm Poultry. The Macmillan Company, New York. $1.50.
WATTS, R. L. Vegetable Gardening. Orange Judd Company, New York. $1.75.
WAUGH, F. A. Beginner's Guide to Fruit Growing. Orange Judd Company, New York. 75 cents.
WAUGH, F. A. Landscape Gardening. Orange Judd Company, New York. 75 cents.
WILKINSON, A. E. The Apple. Ginn and Company, Boston. $2.00.
WING, H. H. Milk and its Products. The Macmillan Company, New York. $1.00.

PERIODICALS

American Bee Journal. Monthly. Hamilton, Illinois. $1.00 per year.
Butter, Cheese, and Egg Journal. A weekly magazine. Milwaukee, Wisconsin. $1.00 per year.
Fruit-Grower and Farmer. A semimonthly magazine. Saint Joseph, Missouri. $1.00 per year.
Hoard's Dairyman. A weekly journal devoted to dairy farming. Fort Atkinson, Wisconsin. $1.00 per year.

Horticulture. A weekly journal devoted to plant culture, landscape gardening, and kindred interests. 11 Hamilton Place, Boston. $1.00 per year.

Market Growers Journal. A semimonthly trade paper for market gardeners. Louisville, Kentucky. $1.00 per year.

Poultry Fancier. Monthly. Sellersville, Pennsylvania. $1.00 per year.

The Country Gentleman. Weekly. Curtis Publishing Company. Philadelphia. $1.50 per year.

Wallace's Farmer. Weekly. Wallace Publishing Company. Des Moines, Iowa. $1.00 per year.

These last two high-grade periodicals should be on the reading table of every farmer. In addition he should subscribe to the leading agricultural paper published in his state. Good reading matter pays for itself over and over again both in dollars and in enjoyment of farm life.

Reports and Bulletins

Annual Report of the Bureau of Animal Husbandry, Department of Agriculture, Washington, D.C., and various reports of your state experiment station may be secured free of charge.

Bulletins are also sent out, among which the following may be mentioned: Lane and Whitaker, "Score-Card System of Dairy Inspection," Bureau of Animal Husbandry, *Circular 139*; Dodge, "Cropping System for New England Dairy Farms," *Farmers' Bulletin 337*. Send for list of bulletins available.

Bulletins on stock raising are issued by the above bureau and by state bureaus. Write for lists; some are very helpful.

Farmers' bulletins, of which a large list is available. Write the agricultural department for this list; check off those desired and mail to your congressman, who will see that you receive them free of charge. Of the large number that are helpful, space will permit only two to be mentioned: "A Successful New York Farm," *Farmers' Bulletin 454*, and "How a City Family managed a Farm," *Farmers' Bulletin 432*.

Yearbook of the Department of Agriculture, the annual report referred to in later pages as the Yearbook. Sent free; write your congressman for a copy. Young men planning to become farmers should by all means secure a copy of this book each year. The following articles may be consulted in connection with the foregoing discussion:

"Farm Labor" (1910), pp. 189–200; "Farm Labor" (1911), pp. 269–284; "Agricultural Education" (1905), pp. 193–218; "Agricultural Education" (1910), pp. 177–188; "Agricultural Education" (1912), pp. 471–482; "Demonstration Work" (1909), pp. 153–160; "Marketing" (1909), pp. 161–172; "Farming for City Men" (1909), pp. 239–248.

Articles

ANDREWS, F. "Reduction of Waste in Marketing." Yearbook of 1911, pp. 165–176.

"A Home Vegetable Garden," *Farmers' Bulletin* 255. See also *Bulletins 62, 220, 433.*

BONSTEEL, J. A. "Truck Soils of the Atlantic Coast Region." Yearbook for 1912, pp. 417–432.

CORBETT, L. C. "A Successful Method of Marketing Vegetable Products." Yearbook for 1912, pp. 353–362.

DEXTER, W. H. and Others. "Opportunities for Dairying." Yearbook for 1906, pp. 405–428. (Discusses the various sections of the United States.)

Farmers' Bulletins 154, 198, 238, 491.

JONES, R. G. "Opportunities in the Dairy Business." *Butter, Cheese, and Egg Journal*, May 21, 1912.

STUBENRAUCH, A. V. "Handling of Deciduous Fruits on the Pacific Coast." Yearbook for 1909, pp. 365–374.

CHAPTER V

COMMERCIAL OCCUPATIONS

Every man who studies along the fine and broad lines of commercial enterprise to-day must recognize the fact that a business career is a profession as noble in its way as that of the lawyer or the engineer. Men and women must be trained for it. — JOHN WANAMAKER

The beginning and growth of commerce. Our vast commercial organization, with its retail stores, wholesale houses, stock exchanges, and clearing houses, may be traced in its rude beginnings to the makeshifts adopted for trading by such miserable savages as the Australian natives. When one native wishes to trade with another, he leaves his commodity on a certain cleared space and hides behind a bush. The other native then examines the article, and after placing what he considers an equivalent commodity beside that of the first, he also hides behind a bush. The first native then advances and examines the article left. If satisfied, he carries it away and the trade is completed. If not satisfied, he carries away his own article and the trade is thus declared off. Crude as such a plan is, it indicates some of the primary ideas upon which all commerce rests, namely:

1. *The desire for what others possess.* The Australian, though a savage, possesses what is developed very nearly into a passion with civilized man, the desire for more things. It is because mankind is not satisfied with the products at hand, but, even to supply his breakfast table, wishes to draw upon the whole world, that commerce throws out its lines to distant Java and Japan and also orders European products by the millions. Progress is accompanied by a

multiplication of desires, and it is the business of commerce to satisfy them.

2. *The sense of relative values.* The Australian native, with the two articles on the ground in front of him, ponders from which he can get the greater satisfaction. This is the same mental process which the boy shows when with ten cents in his pocket, and the question of ice cream or firecrackers before him, he decides to eat rather than to shoot. We also find much the same problem before his father when he decides upon an automobile instead of a yacht, or before the broker who refuses 100 shares U.S. Steel at 97 but buys 60 shares Union Pacific at 135. Shrewd business men have a keen sense of relative values; their success depends largely upon it.

3. *The special mechanism of trade activities.* The paths through the forest, the cleared space, and the bushes were the machinery by means of which the savages traded. The paths have now become wagon roads, splendid railroads, and steamship lines, such speedy and cheap "paths" that bananas may be brought from Cuba to the village store in Oregon, and the nutmegs of Borneo to the frontier post in the Klondike. The cleared space and bushes have given way to stores and counters and clerks, coins and checks and banks, telephone and telegraph and letter, retail store and wholesale house and stock exchange. Just as a boy needs a knife to cut a stick, so commercial men need special machinery to transact business.

4. *The protection of trade.* When the products of the merchant are besieged by robbers on the land or pirates on the sea, he must sell these products at exorbitant prices to safeguard his risk, or otherwise quit business. The Australians planned that the clearing should be a place of peace, that by the traders' hiding behind bushes the chances for hot words and personal combat would be lessened, and that no trade should be binding unless both parties had expressed

themselves as satisfied by offering, taking, or leaving the proffered articles. Business men have always opposed war, — except a few armor-plate and gun makers, like the Krupps, — and their conviction that it is really at bottom "the great illusion" is some day likely to overthrow the war gods permanently. Modern nations throw protection over their citizen-traders, even though they go to the ends of the earth.

Perfection of modern-trade conditions. In each of these four points, in which the savage paved the way, the modern business man has developed the process until it now well-nigh reaches perfection. Modern commerce has become: (1) *Certain.* The present-day merchant no longer takes a wild leap in the dark. He knows prices and can depend upon his orders being filled, delivered, and sold, all in a way no merchant has been able to do before. (2) *Regular.* In ancient India and China the grain markets might be glutted in one province while the people in an adjacent province were starving. During the pioneer days in the West, wheat at harvest time was almost worthless, while its price mounted skyward in late winter. But modern commerce can take account of months rather than days, and in this way suppress considerably the fluctuations and secure regularity. (3) *Economical.* Little savings are beginning to count. When an American salesman cannot undersell a German salesman in the office of a Buenos Aires merchant, nor perhaps win even by a small margin a Johannesburg contract from a British salesman, the duty is forced upon the home office of discharging the slow-moving office boy and the wasteful shipping clerk. (4) *Sensitive.* This international competition keeps the business kings of the world on the firing line, ever alert. A change of a quarter of a cent in the price of cotton closes a cotton mill in Manchester and opens one in Atlanta. With the advent of our beef scandal, down went the profits of the Chicago packers and upward soared the

daily output of the German slaughterhouses. When the commercial machine becomes so enormous, yet so sensitive, more skill is required of the directing hand and more efficiency from the rank and file.

In this contest for world markets, no people have entered with more enthusiasm than have the Americans. The Yankee is a shrewd but aggressive merchant, as others have learned to their cost. But he has also 93,000,000 of home buyers, a vast multitude whose high standard of living provides a splendid market. Commercial occupations consequently have come to number their adherents by the millions; 9.91 per cent of the American nation is engaged in commercial pursuits, a proportion exceeding all other occupations save agriculture. Almost half of our people live in cities and towns of over two thousand five hundred inhabitants, and the relative number is increasing.

EXERCISES

1. Tell how our present system of money was developed. (See encyclopedia or history of commerce.)

2. What can you tell of trade among the Indians? What did they use for money?

3. What rank does the United States hold among the commercial nations?

4. What are our leading exports? imports?

5. Is commerce in your community more or less important than agriculture?

Social standing. 1. *Former position of merchants.* Perhaps you think that nothing need be said about the social standing of the business man, since everybody knows that he is looked up to in his community. But he has not always been so respected. The early merchants were a despised lot. The democratic Spartans believed that *all citizens* were equal — but the merchant *perioeci* were not citizens and

had no political rights. The Athenians thought that such material matters as trading were fit for slaves. Their minds were turned toward art and philosophy. Socrates taught that to have few wants was godlike; Plato would have no place in his ideal state for money, "nor much of the vulgar sort of trade," he says, "which is carried on by lending money." The opinion of Cicero indicates the Roman point of view. "Those who buy to sell again as soon as they can, are," he concludes, "to be accounted as vulgar; for they can make no profit except by a certain amount of falsehood, and nothing is meaner than falsehood." According to the early-church fathers in the Middle Ages, "Agriculture was praised; manufacture did not displease God; but trade could not be pleasing to the Deity." Even to-day there are some of the narrow-minded who sniff at "crude materialism," and think to prove their superiority by disclaiming a knowledge of all things practical.

2. *The merchant's services to society.* The merchant, however, is a real producer, just as truly as anyone else. There is no such thing as "producing" in the sense of creating out of nothing a new product. The farmer causes plows, seeders, and binders to work — and produces wheat. The miller causes trains, elevators, and rollers to work — and produces flour. The merchant causes telephone, stock clerk, salesman, and delivery boy to work — and produces flour *in Mrs. Brown's kitchen* when she wants to use it for baking *Friday morning*. Each produces utility; that is, something which people want to use. Wheat is wanted; the farmer produces the desired result; his labor brings about what may be termed *elementary utility*. Flour, prepared wheat, is wanted; the miller produces the desired result; his labor brings about *form utility*. Mrs. Brown wants flour in her kitchen when she needs it for baking; the merchant produces the desired result; his labors result in *place* and *time utility*. Such utilities are certainly important and

necessary for the well-being of all of us, and the merchant in supplying them is just as truly a producer as is the farmer or the miner. He is entitled to full respect and high social standing if he does his work well.

A certain eminent man of affairs on being asked, "What does business mean to you?" gave a fair statement of the facts of any honorable business, when he replied: "It has meant an effort to prove as far as possible worthy in a field which has been one of the major powers in the development of the life of the world. It has meant satisfaction attained by contributing to the upbuilding and prosperity of my community. For the real business man is a man of constant service to his community. He is not a speculator, operating on capital consisting chiefly of 'nerve' and paper-built schemes, who tries to make something out of nothing and that at the expense of those upon whom he can impose. He discovers and supplies a legitimate demand. He meets a real need with the substantial thing that will satisfy that necessity. Such a man cannot, by the very nature of affairs, become a mere money-grabber. He keeps an eye on the making of profits in business, else he must show his lack of good business capacity — but inevitably he works for the welfare of the community in which he moves."

3. *The present social position of merchants.* There are many thousands of such men who serve society well. Their opinions are eagerly sought in all important matters, their names and pictures are seen in the papers, they hold positions of honor in public enterprises, and they are approved among men. While they often reap great rewards in money, society can well afford to see them become rich. For every dollar that they receive personally, many more go in a business way to all with whom they deal — their workers, those from whom they buy, and those to whom they sell. These men are thus public benefactors and accordingly occupy a position of high social standing. If you enter commercial

life and want to be respected by men, serve them well and thus build a career of deserved success.

You must not conclude from this, however, that just as soon as you take the president's dictation faultlessly, if a stenographer in a wholesale house, you become as prominent as he. If social esteem depends largely upon doing the work of the world well, there is surely such a thing as the relative importance of workers, since the efforts of one man are often of more importance than the efforts of other men. Highest honor in the business world is usually given to those who have been years in the service, and who continue to prove their ability to wear the spurs they have long since won. If you have the ability, the perseverance, and the character required of the successful business man, you will receive social esteem from an ever-widening circle as you go higher.

WHICH BUSINESS SHALL YOU CHOOSE?

The young man who surveys the commercial world has spread before him a great variety of business activities. It would require volumes to describe all of these even briefly — and some of these volumes have already been written. But in one book we can treat only briefly the most important of these kinds of business and leave with you a somewhat extensive list of references. On other pages the subject of positions will be discussed, but before you consider which position to choose think over which business you prefer. Study with care the exercises bearing upon this. When you discover that a certain business appeals strongly to you as a life-career, read some of the books treating it which are listed in the references. Subscribe now, before you graduate, for one of the periodicals devoted to this calling and read it regularly, so that much valuable time for preparation may be utilized.

Merchandizing. The pioneer merchant was the keeper of the old-fashioned, crossroads general store. He kept a little of everything, from the cinnamon bark in the tin carton to the manila rope he uncoiled from the cellar. But the farmers' wants outran his limited stock, so that now when they wish to buy everything of one concern they send an order to some mail-order house. It is the proud boast of some of these houses that they sell everything from a needle to a threshing machine. If the crossroads has become a city, those who still prefer to buy all their goods in one place patronize the department store. Here under one roof, with acres of floor space, miles of aisles, and thousands of clerks, is transacted such a mammoth business that compared to it the wealth of Crœsus is a mere bagatelle.

But the crossroads store has also split up into stores carrying different lines. And of these the number is legion. There are separate stores for each of the following commodities: hardware, implements, china and glassware, dry goods, clothing, furnishings, boots and shoes, fruit, confectionery, meat and vegetables, grain, flour, and feed, lumber and coal, watches, clocks, jewelry and optical goods, drugs, stationery, and the like. Moreover, the stores just mentioned embrace but the one phase of merchandizing, retailing. There are likewise numerous openings in wholesaling, not so well known, perhaps, but substantial callings nevertheless.

EXERCISES

1. Draw up a list of the various commodities, such as dry goods, hardware, drugs, etc., which are sold in separate stores in your town, and place under each commodity the names of the firms who deal in it.

2. Talk with some leading merchant who handles one of these commodities. Ask him how much capital is needed to stock such a business; what the main expense items are; the particular advantages; the disadvantages; his opinion of this business as an opening for a young man.

3. Which particular line of merchandizing in the town offers you the best opening? Give reasons for your answer.

Printing and publishing. Most of the employees of printing and publishing houses are hand workers and hence come properly under the manufacturing classification. Still there remain almost 100,000 others, officials and clerks, whose work and total annual salaries of $100,000,000 are essentially commercial. The publishing industry of any particular firm may be directed toward (1) general or miscellaneous book publishing; (2) books sold by subscription methods; (3) educational or textbook publishing; (4) newspapers or magazines.

The outlook for a young man entering this business is very good. The value of the product increased 34 per cent from 1904 to 1909 and the number of salaried officials and clerks almost doubled. "If one looks over the field," says a leading American publisher, F. N. Doubleday of Doubleday, Page & Company, "one sees opportunities in abundance. One comes upon a great many men who have ideas, but the men who have the ideas and can work them out are many days' journey apart. In the next decade the sale of books will certainly be vastly increased, and these are the men who will do it."

EXERCISES

1. What is the difference between a publisher and a bookseller? between a publisher and a printer? May one company combine all three?

2. Name several of the leading publishers.

3. Is the publishing business increasing or decreasing in importance?

4. What opportunities are there in your community for entering this business?

Real estate. It may seem a simple matter to buy, sell, or lease farm lands, city lots, dwellings, and other buildings. But to carry on such transactions successfully many intricate questions must be solved, which in turn require specialized ability. This the real-estate man attempts to supply. He

studies carefully how to value the different kinds of property in which he deals, informs himself concerning contracts, leases, mortgages, taxes, and titles, and learns how to work to advantage with the owner, the prospective purchaser, the auctioneer, the surveyor, and the architect.

In practice the real-estate man devotes himself to one of several possible kinds of work. He may specialize in office or store buildings, and how to manage them at a profit. In large cities especially such work claims the attention of many real-estate men. Instead of office or store buildings, he may deal in dwellings, building, buying, or selling them, or serving as a renting agent.

Other operators devote themselves to developing new tracts of land. They may buy a tract near some city, lay it out in blocks and lots, build sidewalks and at times houses as well, and then, by inducing people to move in, start a new suburb whose improved lots sell considerably higher than did the rough tract out of which they were formed. Of course such an operator must be far-sighted and shrewd in estimating which way the city's population is to move, or his proposed new suburb may remain only a dream. However, population and industry are constantly shifting in their location, and the real-estate man who is alert enough to buy and sell at the right time is assured of profitable returns.

Since people attach great importance to their farms, houses, offices, and other buildings, the man who aids them in handling all such property with increased satisfaction to themselves performs a service well worth while.

EXERCISES

1. Is there much buying and selling of real estate in your town? Is property rising in value? Are new building tracts being developed?

2. How many real-estate firms are there in your town? In what branch of real estate does each specialize?

3. Call upon some real-estate man. In what ways does he make his money from real estate? Does he combine any other business with real estate?

4. What successful methods have real-estate agents followed in their business? Which of these would not be advisable for you to attempt in this community? Which would likely prove successful?

Insurance. One realizes, if he thinks over the matter for a moment, that life is full of uncertainties. Train wrecks, sunken ships, fires, tornadoes, sickness — these are some of the things that prevent us from being sure we can do the thing we plan to do. It is considered necessary in business, however, that one have this sureness. For this purpose insurance was developed. In the seventeenth century certain merchants who frequented the coffeehouse kept by Lloyd agreed among themselves that if a member should lose his cargo in the foreign trade, his loss would be made good by the group. In this way, each merchant could trade with assurance because the risk of loss would be borne by many, not by himself alone.

This principle upon which insurance is founded — making the individual secure because his risk is shared by many — has been applied to an ever-increasing variety of events. Accordingly we have such different kinds of insurance as fire, marine, tornado, steam boiler, plate glass, accident, sickness, and life. Insurance is coming to be regarded as a commodity, in much the same light as a suit of clothes, a house and lot, or an auto truck.

In the home offices of the insurance companies, positions are available for actuaries, bookkeepers, file clerks, stenographers; in fact, one may say the beginner will find here a variety of clerical positions. However, insurance companies are particularly interested in young men who show promise of ability as salesmen. They train these young men at their home offices and then assign them to some branch office where they are responsible to the local

manager. Insurance is by no means easy to sell, but those who show ability in this respect earn good commissions and may in time become branch managers.

EXERCISES

1. Do insurance men secure business by opening an office or by field work?

2. Call upon some successful insurance man. Ask him how he locates his prospects; how he makes a sale.

3. What are some of the advantages of this business? the disadvantages?

4. Has some insurance company its home office in or near your city? What opportunities does it offer for employment?

Banking. In buying and selling we require some sort of standard with which to measure the value of different articles. Such a standard is called money. It is minted or printed by the government in vast amounts, and for the convenience of its owners is received from them or paid out to them by the bank to whom they have intrusted it. Strange as it may seem, however, currency is too limited in amount and too inconvenient to serve the needs of business; it must be supplemented by credit. So, as a matter of fact, to-day for every four dollars currency that passes from hand to hand in trading, ninety-six dollars credit is employed. In consequence, the bank's function of dealing in currency is much less important than its function of dealing in credit. It offers a business man its well-known credit in exchange for his less-known credit, and charges him interest for the accommodation. Such is the work of the commercial bank, the most numerous of all banking institutions.

In small towns the banker also advises with customers concerning wills, mortgages, savings, and investments. In cities, however, specialization takes place, resulting in the development of trust companies, savings banks, and bond

and brokerage houses. As a consequence, there is a variety of work available in financial institutions, the duties of the small-town cashier, for example, being quite different from those of the city bond salesman.

The departments of a bank are as follows: (1) *Receiving*. The receiving teller accepts deposits from customers and after checking up the amounts turns them over to the next department for recording. (2) *Bookkeeping*. The bookkeeper makes careful record of all transactions, since fraud and dishonesty must be guarded against and every account be kept in an accurate and systematic manner. (3) *Loans and discounts*. The bank makes its profits by loaning its funds at interest, but needless to say its officers must exercise care concerning the person who would borrow or whose notes are offered them for purchase. (4) *Paying*. The paying teller examines the commercial paper presented him and if satisfied as to its genuineness, he passes out the bank's funds in payment. Other departments are collecting, correspondence, exchange, and advertising. Employment with these financial companies may impress the average young man as somewhat conservative, with advancement rather slow. In general, banking is a substantial business with good prospects for the future.

EXERCISES

1. On what does a bank make its profits?

2. What financial institutions has your town?

3. If any of your friends are employed in these institutions, ask them to tell you about their work.

4. Interview some leading banker. Ask him how he became a banker; what positions there are in banks for young men; what qualifications he considers essential; if he recommends banking as a good vocation for a young man to enter.

GENERAL SUGGESTIONS FOR CHOOSING YOUR PARTICULAR BUSINESS

Selection according to qualifications, desires, and capital. While choosing your particular business the following three suggestions may prove of value to you: (1) You may select that business in which your natural ability and qualifications make the possibility of success greatest. If your manners are good and your temper is genial, such a position as "trouble mender" in a retail market might be secured rather than work on the adding machine in a bank. (2) You may enter work which, to you at least, is interesting. If you like to deal with big, bulky packages and to see piled up all around you the results of your activity, you might become shipping clerk for a wholesale grocery house. (3) Should you desire to go into business for yourself, you can choose from the large number of available business enterprizes the one for which your capital is sufficient.

Consideration of possibilities of success and failure. Before engaging in business for yourself, however, give careful thought to the probabilities of your succeeding or failing in it. "Friction, and with it some loss of power or energy, is inseparable from the conduct of all business, as indeed of all other forms of human endeavor," says Bradstreet's Mercantile Agency, "and it is no surprise to find that in a country such as the United States, where many thousand new enterprises are added each year to the business community, there should be thousands of failures. This business community, totaling in the year 1914 some 1,749,000, naturally includes many poorly provided, in different ways, to embark upon business life." The number of failures among commercial concerns in 1914 is given as 16,769. Bradstreet's draw up the following table in which the causes of failure should have your closest attention:

WHY MEN FAILED IN 1914

Cause of Failure	Number	Cause of Failure	Number
Lack of capital	4928	Unwise credits	411
Incompetence	4705	Neglect	371
Specific conditions	2753	Failure of others	304
Fraud	1593	Extravagance	148
Inexperience	941	Speculation	121
Competition	494	Total	16,769

Run carefully down this list point by point, with your own prospective business in mind, and ask yourself such definite questions as these: Do I know enough to run this business? Have I enough money to make it prosper? Have I the interest in it and the push in me sufficient to escape the dangers of neglect and competition? In short, have I all the necessary qualifications to make a success of this business even under adverse circumstances? After a fair and candid consideration of these questions you will be in a better position to decide whether to start in business for yourself, or to work, at least a while, for some firm already established.

Consideration of the effect of modern combination and competition. The general tendency is toward combination; that is, the control of a greater share of the market by fewer but larger concerns. Unless you have a unique specialty or some other particular advantage, or you wish to remain in a small town, the chances are that the competition of the larger establishments will be a serious disadvantage to you. R. H. Macy and Company in their department store at Broadway and Thirty-fourth Street, New York, employ some 5000 people. One block away is the mammoth store of Gimbel Brothers, with Saks and Company between. At Eighth Street and Broadway is John Wanamaker's, with over 5000 employees, not to mention Wanamaker's other

great store in Philadelphia. In Chicago, Marshall Field and Company have an army of 10,000 at work. A similar tendency toward large companies is found in other commercial organizations, such as wholesaling and banking.

Perhaps you are like most young men who survey the commercial field; they find themselves unable to own one of these immense stores or banks and so plan to enter its service as an employee. And while deciding which particular business to enter, they also think over the equally practical question, Which position do I prefer to hold?

EXERCISES

1. Which particular business appeals to you as most attractive?

2. What advantages are there in engaging in business for yourself? What disadvantages?

3. What advantages are there in entering the employ of others? What disadvantages?

4. Will different boys feel the same about the respective merits and drawbacks covered in the two preceding questions? Give reasons for your answer.

5. What is the work of a mercantile agency?

6. Does your town need badly some special store which no one has yet opened?

AFTER CHOOSING YOUR PARTICULAR BUSINESS WHICH POSITION SHALL YOU SELECT?

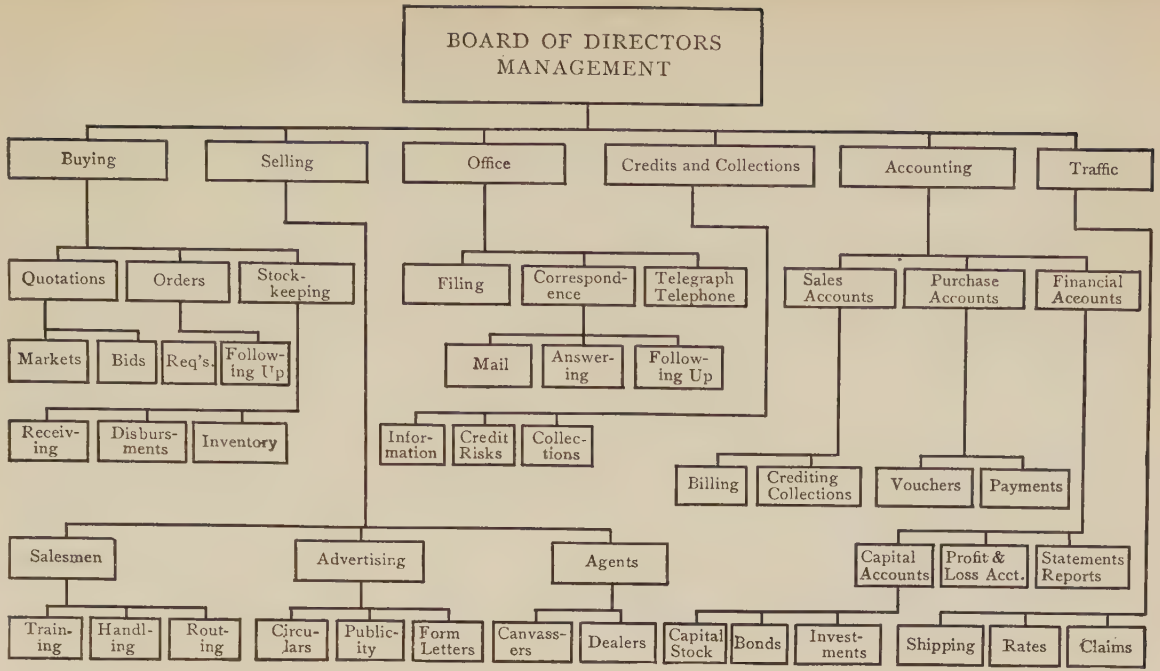
Complexity of modern commerce. If you were to stand in one of the great department stores, or visit a gigantic mail-order house, or inspect the central offices of a large insurance company, you would doubtless be so confused by the complexities spread out before your eyes that you would not know until after careful study what position you would choose to fill. Yet each of these big concerns has a carefully planned organization in which each employee is fitted into some definite place and has certain duties to perform. It

might aid you, perhaps, in thinking out what position you wanted if you knew something of this general organization and arrangement. While each concern has a somewhat different plan developed to meet its needs, there are similarities of organization to be found in all concerns. This general plan which they have adopted may be indicated by the chart on the following page.

Study this chart carefully. How many main divisions has this organization? In what three ways are goods sold? Under what main division of the business does answering letters come? How many kinds of accounts are there? If a Parisian milliner raises the prices of hats and so writes to the firm, to what department should these new quotations be sent? Some goods are crushed in transit; to what main division is this matter referred? to what particular part of this division? Under which division would you work as a bookkeeper? a salesman? a stenographer? an advertisement writer?

Selling division. It is the people employed in this division who represent the firm to its customers and bring money into the cash box. Most of them sell goods to the customer face to face, as personal salesmen employed in retail stores, as bank tellers, or out on the road selling insurance or representing a wholesale house. In all these positions there are certain things you can do to become a more successful salesman and thus build up a bigger business.

1. *Knowledge of the goods.* In some cases this requires long preliminary training. In department stores boys of fourteen to eighteen desiring to become salesmen begin as stock boys or floor boys at $3 to $4.50 per week and usually become salesmen only after several years of preliminary training. In retail groceries boys begin as helpers, errand boys, and delivery boys, and learn the business in that way. It is needless to say that the young man who studies his goods learns more quickly to know them, and sooner becomes ready to satisfy this first requirement of a salesman.



The organization of a commercial concern

The activities are first divided into several main departments, which in turn are further subdivided into specialized positions

2. *Knowledge of the customer.* The ordinary clerk lays goods before customer after customer in the same perfunctory way. The skilled clerk reads people like a daily paper and deftly adapts himself and his wares to each particular customer. His manners are good, he has tact, he knows how to hold his temper even before the most spiteful person. He dresses himself neatly, and he arranges his stock in a well-ordered and artistic way which pleases customers. He does not say, "I should like to sell you this coat for $15," but "You would be pleased with this coat, I believe. It is unusually good quality for the price."

3. *Loyalty to the house.* The house has built up a big business and needs to have a big organization. You are not merely Ben Smith, an individual; you are a member of a concern, associated with hundreds of other employees. You are called upon to fit yourself into this system and, in order to do so, you should comply willingly with the requests made of you. On the other hand, it is not an ideal salesman who completely effaces himself. You should always look out for the best interests of the house. When in doubt, when instructions are vague, when the new thing faces you, remember that the house wants results and do your best.

4. *The customer's interests.* The foundation of your company's prosperity is good service to customers. Cheating, rudeness, poor advice, are like sticks of dynamite placed in this foundation. Of the assortment and prices afforded by your house you should see that your customer gets what will suit him best. As your customers move toward the door, think what opinions of courteous treatment and good service they are carrying away.

5. *Remuneration of salesmen.* Efficient salesmen are worth a great deal to any house. The salary paid the beginner ranges from $10 to $12 per week, while that paid the experienced man is from $15 to $20 per week. Payment is often conditional on the sales made, and

exceptional clerks receive salary increases accordingly. In the case of traveling salesmen this often mounts to highly satisfactory figures. Not a bad way to start as a salesman is to canvass for magazines, books, aluminum ware, soap, maps, or some one of a hundred other useful and attractive articles. Try this for a few days at least. You will probably not make much money, but you will get rich returns in experience. Analyze each case, why you sold or why you failed to sell, and you will be attending the best school of salesmanship it may ever be your fortune to find.

6. *The advertiser.* The advertiser does not meet the customers face to face, but puts the selling talk on paper and tries to catch their eye. The proper place to secure the advertising men, it would seem, is from behind the sales counter. Yet few clerks have the breadth of view required or the ability to set forth on paper a good sales talk. Hence more advertising men have come into the business by way of newspaper work. The helper to the advertising man is paid from $3 to $6 per week. Those who have some training or who show ability as helpers may draw from $12 to $30 per week as an assistant. Assistant managers receive from $20 to $35 per week; managers, according to their ability, receive from $40 to $100 per week.

EXERCISES

1. Observe salesmen as they sell to you. How do the most successful ones meet prospective buyers? How do they find out what you want? What plan do they follow when they do not have what you ask for? How do they close the sale? How do they take leave of you?

2. What advantages are there in the salesman's work? What disadvantages?

3. Talk with an advertising man. Does he give all his time to this work? How did he learn the business? How long has he been in it? What salary does he receive?

4. Study carefully the advertisements in some high-grade publication, and draw up a list of qualifications which the advertising man should possess.

Buying division. 1. *Nature of the work.* Before merchandise can be advertised or sold, the store must decide what it has to offer; quotations on these articles must be secured, orders must be placed, and the stock cared for and prepared for sale. All these processes are in charge of the buying division. In department stores, for example, the work of this division is further divided into four subdivisions: namely, the buying organization (the employees being buyers, assistant buyers, heads of stock, and office clerks); the receiving room (in which are the receivers, examiners, bill clerks, and porters, whose work is to receive the goods ordered by the buyers); the marking room (where goods are priced, the employees being termed markers); and the stock room (in which the surplus merchandise is stored until called for at the retail counters).

2. *Remuneration and opportunities.* Boys entering the lowest positions receive from $3 to $8 per week. They can work up to assistant positions paying from $15 to $30 per week, and if they show exceptional ability they may receive annual salaries of from $1000 to many thousands. The outlook for well-qualified buyers is good at present. "But little attention up to this time," writes the editor of "Business Man's Library," "has been paid to the science of buying; this too, in the face of the fact that there is no department that contributes any more to the success of a business than that concerned with the purchase of material, stock, and supplies. When it is considered that buying requires not only keen, shrewd, business judgment but also a vast amount of technical knowledge compactly arranged, it is evident that the systematization of the department of purchasing is worthy of careful research, study, and treatment." Large rewards are to be given the young men who are able to do this.

EXERCISES

1. Visit some leading store. Find out how the buying is done.

2. Why are the problems of buying being studied so intently by commercial concerns?

3. What plan is followed in purchasing supplies for your school?

4. A dry-goods firm in your town is about to buy a $40,000 winter stock. What problems must be considered?

5. Think over the various things a buyer must know and do. What are the essential qualifications for a good buyer?

Office division. 1. *Complexity of the work and qualifications demanded.* There is a vast amount of routine connected with any big business. Thousands of letters, hundreds of telegrams and telephone calls, pour in upon the main house. The salesmen and the buyers require some sort of a clearing house for their operations. This mass of detail must be classified, attended to, and recorded, and it must be done with accuracy and dispatch. Such is the work of the office division. Among the employees in this division are office boys, stenographers, typewriters, clerks, paymasters, cashiers, assistant office manager, office manager, and often chief officials of the firm.

There has been a great advance in office practice during the last few years. It is only by improved filing devices, better business-getting correspondence, more complete systematization of routine, that big business can run in an orderly way. And the young man who aims at office work to-day should not merely write the old-time "good hand" and be "quick at figures"; he should use a typewriter and an adding machine, and be informed on all the new methods of securing efficiency in office practice.

Hundreds of boys will sweep out the office carefully, just like any mechanical broom; hundreds of stenographers will turn out a letter with no more thought than a machine; but the office boy who is a budding business manager and the

stenographer who quickly becomes a private secretary are eagerly sought by alert business men.

2. *Remuneration and opportunities.* A capable young man may secure a position as office clerk or assistant at a salary of $8 to $10 per week. Or he may commence as stenographer and typewriter at about the same salary, and after several years advance to $25 or $30 per week.

Here let us quote briefly from two men who have met a large success in this field. "There is no calling," says E. V. Murphy, Official Reporter, United States Senate, "which affords such an opening for young men who are just starting out in life as that of stenography. The demand for stenographers is so great in the government departments that it seems impossible to supply it."

"If I were fifteen years old again," are the words of Frederic Irland, Official Reporter, United States House of Representatives, "and wanted to be earning $25,000 a year in some great business by the time I was thirty, I would study to become a good amanuensis and get into the manager's office as a stenographer. There is no quicker, easier way to 'burglarize' success."

EXERCISES

1. Visit some large office division. Note the general arrangement. What efficient methods do you see employed?

2. Talk with some successful business man. Learn how his correspondence is sorted for him; how his telephone calls are arranged; how his time is kept free from interruption. What other plans does he have for getting much work done easily?

3. Learn something of each of the following: Weekly reminder pad, letter file, carbon copy, card index, multigraph, form letter, dictaphone, cash register, adding machine, mechanical calculator.

4. What is the test of a good business letter? of its style? of its arrangement on the page?

5. If assigned to some manager as stenographer and typewriter, how could you become more valuable to him? What advantages over the usual stenographer's work has the position of private secretary?

Accounting division. Each day there must be a careful listing and checking up of all transactions. Every purchase made passes through a certain routine; any inaccuracies must be detected and the account recorded so that it may easily be found if needed. Every sales order, whether turned in by the sales people or customers, must have the same careful attention and recording. Accounts with persons are to be kept and financial statements made. All this work falls to the accounting division which may be separate or, as is the case with many firms, merely a branch of the office division.

The usual entrance to this division is as bookkeeper. The salary is about $12 per week at the start and increases to $20 or $25. Capable bookkeepers frequently advance to the better-paid positions of cashier, buyer, or head of the credit or cost departments, etc. The outlook is excellent for well-trained accountants.

Credit division. If the firm is large or carries many charge accounts, there is need of someone to investigate the standing of customers who ask for credit, to approve or reject charge sales, to estimate the total credit risks carried, and to collect accounts. This is the work of the credit man, and if the volume of business is large he may have several assistants. The usual start in this department is as collector.

Traffic division. Should the firm use railroad and steamship service a great deal, a series of problems arises regarding the best routes over which to have goods shipped, what savings can be made in rates over different lines, and what are the relative advantages of freight, express, and parcel post. Such problems are in the province of the traffic manager, who may be an independent officer, or under the direction of the office division. He also takes charge of any damage claims in which the firm may be involved. There are not at present so many good openings in this division as in the others.

EXERCISES

1. Talk with a bookkeeper. Ask him how he learned bookkeeping; how long he has worked at it; what salary and opportunities he considers there are for young men as bookkeepers.

2. What is the difference between a bookkeeper and an accountant?

3. What is meant by the initials C.P.A. signed after a man's name? Of what importance is this title?

4. Are there any general practicing accountants in your town? If so, call upon one, and ask him about his profession.

5. Visit some leading store or bank. Who has charge of the credit work? Does he rank such a position as attractive?

6. Name some commercial concerns that would require no separate traffic man; some in which his work would be of considerable importance.

CONDITIONS OF SERVICE IN COMMERCIAL OCCUPATIONS

Variation of the hours. The hours per day in commercial work are much fewer, of course, than in agriculture. Only in small villages are clerks still required to "open up" at 7 A.M. and hold themselves in readiness to serve the last straggler until 10 P.M. Grocery clerks as a rule still begin at 7 in the morning and remain until 6 or 6.30 at night, with evening hours Saturday. While conditions vary with the city and the season of the year, dry-goods clerks often work from 8.30 A.M. to 5.30 or 6 P.M. and to 9 or 10 P.M. on Saturdays, with an hour off for lunch. Stenographers, typewriters, and bookkeepers generally work from 8.30 or 9 A.M. to 5 P.M. Banking hours are the shortest, yet there is much to do both before the opening hour at 9 A.M. and after the closing hour in the afternoon.

Condition of healthfulness. As to healthfulness, the conditions in commercial occupations are generally good. But in some grocery and drug stores and in the older dry-goods

stores, the ventilation is often poor, and the lighting is occasionally defective. The work of the stenographer, typewriter, bookkeeper, and retail clerk is at best nerve-trying, and the end of the day is liable to find the body full of fatigue poisons. The employer can do much to better these conditions, and many enterprising firms are doing this. The employee can do something to adjust himself, with minimum fatigue, to such conditions by maintaining proper habits of diet, recreation, and sleep.

EXERCISES

1. Visit some dry-goods store. What are the working hours of the employees? Are vacations allowed employees? If so, are these vacations with or without pay? Find out the same facts about banks, drug stores, grocery stores, and confectioneries.

2. In which businesses are there seasonable fluctuations, with much help needed during the holidays and many men laid off during July and August? What might this mean to you personally?

3. In which is the demand for employment relatively steady?

4. Have you ever worked in a store or been in one where the ventilation, heating, and lighting were bad? where they were particularly good?

HOW YOUNG MEN ENTER THE COMMERCIAL OCCUPATIONS

Varying requirements for entrance. Since commercial work is so diversified in nature, the requirements for entrance may also be expected to cover a wide range of qualifications. In some positions, as that of grocery boy, meager attainments will secure a place. In others, as that of accountant, a high-grade preparation is necessary. Quotations from letters received from the employment managers of two first-rank insurance organizations will be of interest in this connection.

STATEMENTS FROM EMPLOYMENT MANAGERS CONCERNING ENTRANCE CONDITIONS

With rare exceptions we recruit our force of men from boys of sixteen or seventeen years of age. Clerical positions requiring older and more experienced men are filled by promotions. Many of our boys have developed into officers and superintendents; some have graduated into cashierships at our agencies scattered throughout the United States; while others have become very successful solicitors. True these promotions are the exceptions, but nevertheless they prove that the opportunity is there.

Salaries are on a graded scale, the general plan being to give some increase each year if possible. We pay $25 per month for the first year, automatically increasing this amount annually until $35 per month is reached. The ability of the clerk and the character of the work have much influence on the salary. From boys they graduate into the junior clerkship class at higher compensation.

We always have more applications than can be considered. This fact enables us to make selection. Character, intelligence, adaptation, and education have first consideration. Every applicant before acceptance is examined in the fundamental principles of arithmetic and in writing and spelling. We file all applications rated 75 per cent or better, the highest-rated boys, of course, being given first choice by us when a vacancy occurs.

This plan necessarily requires a boy to have at least a thorough grammar-school education, and my experience has proved that the boy who attends high school for three or four years is far in advance of the grammar-school graduate, but the boy who has only attended one year at high school and left at a point where the high-school education was to do him the most good is less qualified than the grammar-school graduate. This may not seem consistent, but it is true from my viewpoint nevertheless.

We provide instruction for selected clerks in advanced arithmetic, elementary and advanced algebra, and in the use of English with especial regard to correspondence. Ambitious clerks soon realize their shortcomings and many avail themselves of the evening classes in the grammar and high schools, and the courses in accounting and bookkeeping conducted by the universities near us.

It will be seen from the above that no especial training is necessary for our work. We want native ability with the elements of a general education. Upon this foundation we do our own training.

SUGGESTIONS TO PROSPECTIVE BUSINESS MEN

No matter what business you choose or which commercial position you enter, there are two practical ways by which you can make the most of yourself.

Self-preparation. Unless necessary in your case, is it not a mistake to begin as an office or stock boy at $3 a week and serve two or three years at a salary under $6 per week? If you can attend high school or a business college, will not your time spent in study be worth much more to you in laying the broader foundation which business men in this age surely need? If possible, go to college and study general economics, sociology, and political science. Take the special courses in commercial law, accounting, advertising, and business administration — courses which so few colleges offer at present that the supply of trained men cannot soon become too large. Still you may, although well trained, have to begin at the bottom; but your advancement will be rapid, and in the end you will distance the poorly prepared youth who began years before you did.

Let us suppose that upon graduation from college you enter the ranks of commercial stenographers. "What better way is there to learn a business than through stenography? Trusted with most valuable business secrets, occupying close and confidential relations with managers and executives, opportunities for advancement in the business inevitably present themselves. Knowledge that many men now prominent in the commercial and political world, such as Cortelyou, ex-Senator Mason, and many others, began their careers as stenographers will serve as an inspiration. A knowledge of shorthand will take from the college man that feeling of unpreparedness for the real battles that are to come. It will give him a grip, a hold upon the world of business that will strengthen his resolves and whet the edge of his ambition. He can always, in almost any event,

earn a good salary; and if he applies himself diligently to the study he can with little difficulty become a high-grade stenographer, the kind that business men seek, and, having found, are loath to lose, regardless of salary."

Preparation for advancement. Once well qualified and in a good opening position, do not begin to fossilize. No barnacles are welcomed on the ship of progress. If you are a salesman, study to become an expert. Observe the other salesmen, look with deeper penetration into human nature, think over selling problems, read books and articles on salesmanship.

If you are a bookkeeper and the years seem to find you at the same old desk with no prospects ahead, remember that there is the intricate but interesting and well-paid profession of accountancy. And some books on accounting — of which there are many — will be a morning sun on your dark horizon.

There is a man ahead of you who is your chief. Study him and find out his strong points. Consider what qualifications are necessary for holding such a position and, so far as possible, make them yours. Read some of the many helpful business books. There are to be had first-class books on business management, corporation finance, accounting practice, business efficiency, almost any subject you need to study. Business men have learned that in books many of their hard knots are untied. And by studying the right ones you will learn how to fill successfully the position ahead of you. Some day your superior will have moved on or moved out, and opportunity will face the office force. Are you ready?

Here is a concrete case for illustration: Some young men in New York City decided to study evenings in a school of commerce. Their average salary earned during the day was $75 per month. The second year it was $93 and the third year it had increased to $120. The fact that their salaries were increased $45 a month during the three years

when, in addition to their regular duties, they carried these commercial courses in the evening, indicates a decidedly promising future for them. Such cases may be found not alone in New York but in the United States as a whole. In our great arena of business there is work to do, much skilled, high-class work, and its rewards will go to the men of industry, ability, and training whose ideals are high.

EXERCISES

1. How do you explain the fact that later in life high-school and college graduates overtake and surpass those who "begin at once"?

2. Interview some successful business man you know. Make out a list of the different steps in his career.

3. Which business positions call for rather bookish study? Which for a study primarily of human nature?

4. What opportunities have you for studying successful business men and methods?

READINGS AND REFERENCES

Books

ALLEN, F. J. Business Employments. Ginn and Company, Boston. $1.00.

BRISCO, N. A. Economics of Business. The Macmillan Company, New York, 1913. $1.50.

Business Man's Library. Ten volumes. A. W. Shaw Company, Chicago, 1907.

CARNEGIE, ANDREW. Empire of Business. Doubleday, Page & Company. Garden City, New York, 1902. $3.00.

CODY, SHERWIN. How to do Business by Letter. The Ronald Press Co., New York, 1912. $1.00.

DAVIS, R., and LINGHAM, CLARENCE H. Business English and Correspondence. Ginn and Company, Boston, 1914. $1.00.

DAWSON, MILES M. The Business of Life Insurance. The A. S. Barnes Company, New York, 1906. $1.50.

FISKE, AMOS K. The Modern Bank. D. Appleton and Company, New York, 1904. $1.50.

Fowler, N. C., Jr. Practical Salesmanship. Little, Brown, and Company, Boston, 1911. $1.00.

Handbook for Advertisers. International Textbook Company, Scranton, Pa., 1910. 50 cents.

Higgenbotham, Harlow N. The Making of a Merchant. Forbes & Company, Chicago, 1906. $1.50.

Huffcut, Ernest W. Elements of Business Law. Ginn and Company, Boston, 1905. $1.00.

Klein, F. J. Elements of Accounting. D. Appleton and Company, New York, 1911. $1.50.

Moody, Walter D. Men who Sell Things. A. C. McClurg and Company, Chicago, 1911. $1.00.

Phelps, Arthur, and Carnegie, Andrew. Transaction of Business and how to Win Fortune. Forbes & Company, Chicago. $1.00.

Practical Real Estate Methods. Thirty Real Estate Experts. West Side Y. M. C. A. New York, 1909. $2.00.

Pratt, Sereno S. Work of Wall Street. D. Appleton and Company, New York, 1912. $1.75.

Prendergast, W. A. Credit and its Uses. D. Appleton and Company, New York, 1912. $1.50.

Salesmen's Handbook. International Textbook Company, Scranton, Pa. 50 cents.

Sheldon, A. F. Art of Selling. Sheldon University Press, Libertyville, Ill., 1911. $1.25.

Stockwell, Herbert G. Essential Elements of Business Character. Fleming H. Revell Company, New York, 1911. 60 cents.

White, Horace. Money and Banking. Ginn and Company, Boston, 1911. $1.50.

Woolley, Edward M. Junior Partner. E. P. Dutton and Company, New York, 1912. $1.25.

Pamphlets

Accountancy and the Business Professions. Students' Aid Committee, 25 Jefferson Ave., Brooklyn, N.Y. 10 cents.

Banking. The Vocation Bureau, Boston, 1911. 25 cents.

Department Store, The. The Vocation Bureau. Boston, 1912. 50 cents.

Grocer, The. The Vocation Bureau. Boston, 1911. 15 cents.

Periodicals

Advertising and Selling. Monthly. Advertising and Selling Company, New York. $2.00 per year.

Buildings and Building Management. Monthly. Patterson Publishing Co., Chicago. $2.00 per year.

Dry Goods. Monthly. Dry Goods Publishing Company, New York. $2.00 per year.

Dry Goods Economist. Weekly. New York. $5.00 per year.

Dry Goods Reporter. Weekly. Chicago. $3.00 per year.

Grand Rapids Furniture Record. Monthly. Grand Rapids. $2.00 per year.

Hardware Age. Weekly. David Williams Company, New York. $2.00 per year.

Magazine of Wall Street. Biweekly. New York. $3.00 per year.

Modern Grocer. Weekly. Chicago. $2.00 per year.

Office Appliances. Monthly. Chicago. $1.50 per year.

Printers' Ink. Weekly. Printers' Ink Publishing Company, New York. $2.00 per year.

System. Monthly. A. W. Shaw Company, Chicago. With premium book $2.00 per year.

The Business Educator. Monthly. Zaner and Bloser, Columbus, Ohio. $1.00 per year.

The National Banker. Monthly. Chicago. $2.00 per year.

The Real Estate Magazine. Monthly. New York. $2.00 per year.

Articles

Brett, George P. "Book Publishing and its Present Tendencies." *Atlantic Monthly*, April, 1913, pp. 454–462.

Chesebrough, William. "Real Estate." Careers for the Coming Men (by Whitelaw Reid and Others), pp. 145–156.

Davis, H. "Department Stores." *Everybody's Magazine*, Vol. XVII, p 312.

Doubleday, F. N. "Publishing." Careers for the Coming Men, pp. 219–226.

Dryden, J. F. "Life Insurance." Careers for the Coming Men, pp. 157–170. Saalfield Company, Akron, Ohio.

Frederick, J. G. "Advertising Man's Place in Selling Organization." *Printers' Ink*, October 13, 1910, pp. 20–25.

Jones, C. E. "Advertising Manager's Job." *Printers' Ink*, October 19, 1911, pp. 58–62.

SMITH, CHARLES F. "Commercial Life." Careers for the Coming Men, pp. 45–52.

SWEETLAND, C. A. "Behind the Scenes in a Department Store." *Munsey*, Vol. XX, p. 528.

THWING, G. F. "Insurance as a Business." *Cosmopolitan*, Vol. XXXIV, p. 575.

INFORMATION ON BUSINESS BOOKS

The Ronald Press Company, 20 Vesey Street, New York, publishes a pamphlet listing a carefully prepared "One Hundred of the World's Best Business Books." Sent free on request.

CHAPTER VI

TRANSPORTATION

This may be called the Age of Communication, the circulation both of things, including men, and of ideas. — LESTER F. WARD

The fact that transportation makes our social order possible, that it is necessary for carrying on business, and that our political well-being depends upon it, causes us to regard the services of a common carrier as of a public nature. — EMORY R. JOHNSON

STEAM RAILROADING

Without trains our great commercial prosperity could not have been developed. It is only because of the through freight that the Massachusetts boy may have California oranges for breakfast and the Saskatchewan farmer may become rich selling wheat in the Chicago grain market. But railroads do not merely ship freight; they carry people. The total number of railroad tickets sold in 1912 would, if equally distributed, give eleven railroad trips to every man, woman, and child of our 93,000,000 people. Perhaps you took some of these trips yourself, and appreciate what it means to travel. The carriage at the door, the ticket office, the panting engine, the flying landscape — you dip over the rim of the previously unknown, and return broader minded than before.

Beginnings of transportation. Long before James Watt mused over the rattling teakettle lid, even long before Marco Polo dreamed of a rich Chinese trade, primitive people lived such narrow lives that if they traveled one hundred miles they came to a foreign country with a language so different that they were compelled to use gestures and grimaces instead of words. These primitive people,

however, made the rude beginnings of the wonderful transportation system we now enjoy. "He who first, laying hold of a floating bough," says Tylor, "found it would bear him up in the water, had made a beginning in navigation. The rudest forms of floats, rafts, and boats may still be seen in

A through express train

This splendid train runs from New York to Chicago in eighteen hours. Passengers can eat well-cooked meals, read the late magazines, and sleep in a comfortable bed while en route

use among savages, and even the civilized traveler coming to a stream or lake may be glad to make shift with a log or bundle of bulrushes to help him across, and carry his gun and clothes over dry." [1]

Anthropologists describe most interestingly how rafts on the Tigris and Euphrates rivers were supported by blown

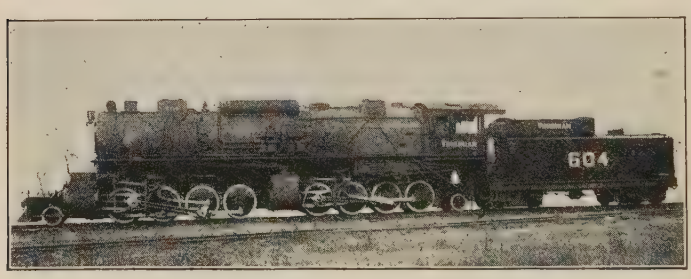
[1] E. B. Tylor, Anthropology.

sheepskins, and how Egyptian potters brought their wares down the Nile in rafts buoyed up by their earthen pots. They explain the way men developed the first clumsy rafts into boats, and how the Phœnicians, the Greeks, the Carthaginians, the Romans, the Norsemen, added bit by bit to this line of development until their successors to-day cross the Atlantic in approximately four days, in a steamship supplying all the comforts of a modern hotel. They can also picture the remote beginnings of the wheel, the development of the rude cart, the war chariot, and the carriage. It is for the modern historian, however, to tell the story of how the carriage and the steam engine were combined and a railroad was the result.

Development of American railroading. The pioneer American railroad was the Baltimore and Ohio, its first rail being laid July 4, 1828, by Charles Carroll, the only man then living who had signed the Declaration of Independence. So relatively expensive was railroad building then that considerably more was spent in laying this road to the Ohio River than the entire wealth of Baltimore's citizens. And so ignorant were the promoters of this enterprise as to the nature of the undertaking that "they had to appoint a committee to go and find out what a railroad was before beginning operations."

The early builders of this and other lines were scorned by their conservative neighbors. When Oliver Evans attempted to get a patent for "a steam wagon," the Pennsylvania legislators ignored his request "as the hallucination of a disordered mind." His statement, "the time will come when people will travel in stages moved by steam engines from one city to another, almost as fast as birds can fly, fifteen or twenty miles an hour," was ridiculed. An Englishman proved to his contemporaries that rapid railroad travel caused a new disease, it being a notorious fact, he declared, "that the brains of business men were so addled

by the swiftness of the journey from Manchester to Liverpool or London that they often forgot what they went for, and had to write home to find out." "Strange as it may seem," said Henry Williams, one of the early railroad directors, in a speech in Worcester at the celebration of the opening of the Boston and Worcester Railroad, July 6, 1835, "these enemies were to be found principally among the rich and powerful — the very class of men who possessed the most ample means, and so might have been



A powerful freight locomotive

Its weight is 752,000 pounds, its boiler pressure is 200 pounds to the square inch, its drive wheels are 16 in number, and it can exert a continuous pull on the drawbar of 138,000 pounds

expected to be first and foremost in advocating and prosecuting an important, a notable public enterprise. Very many great men, very many rich men refused all participation, scoffed at our project, pointed at some of us the fingers of scorn and bandied such epithets as 'hare-brained enthusiasts,' 'visionaries,' who 'almost deserve to be sent to the madhouse.'"

But the railroad was based upon right principles and was bound to succeed. Its early advocates, however, made numerous mistakes and were subjected to many discouragements, but each decade witnessed an increased mileage. In 1830 there were 23 miles of track in the United States; in 1840, 2818; in 1870, 52,914; in 1900, 193,346; and

to-day the main tracks, second tracks, and sidings total such an enormous length that they would send a double band of steel rails around the world fourteen times with several thousand miles of track left over. This exceeds the mileage of all Europe by 10 per cent, and is two fifths of the entire railway mileage of the world. Our railroads have a vast army of 1,669,000 men working for them, and of such employees you may see fit to be one.

Different phases of railroad work. When someone says railroading, you may think of an engineer leaning out of his cab window, a brass-buttoned conductor, or a brakeman on the top of some freight train. Yet there are many other kinds of workmen, a fact which indicates a considerable variety of openings. We can, perhaps, present this broad field of railroading most adequately by answering the question, What services must be performed by the entire organization of a railroad company? (1) Roads must be built, bridges thrown across streams, stations and section houses constructed. And after these are completed they must be kept in good repair. In addition, a large amount of equipment, such as engines and cars, must be bought and also kept in repair. Then these engines and cars must be made into trains, manned, and run over the tracks. These activities constitute the most conspicuous phase of railroading, but they are only one part of it. (2) Business must be secured from shippers and passengers, and charges made. (3) Accounts must be kept with as much care as in a bank or department store, legal matters must be attended to, and the enterprise financed. (4) Supplies must be purchased, real estate bought and sold, insurance taken out, and various relief policies worked out in connection with the employees. To see that these four general duties are properly performed, the railroad organizers create separate departments. These will now be discussed in turn, and openings for young men pointed out.

EXERCISES

1. Which service do you consider of greatest social importance — the carrying of freight, people, or messages?

2. Of what governmental importance are railroads? Why did the Roman conquerors build roads? Why did the United States government give land bounties to Western railroads?

3. On what railroad do you live? Who is its president?

4. Who appoints a railroad's president? Who owns a railroad?

5. If any of your friends have gone into railroading, what are their present positions?

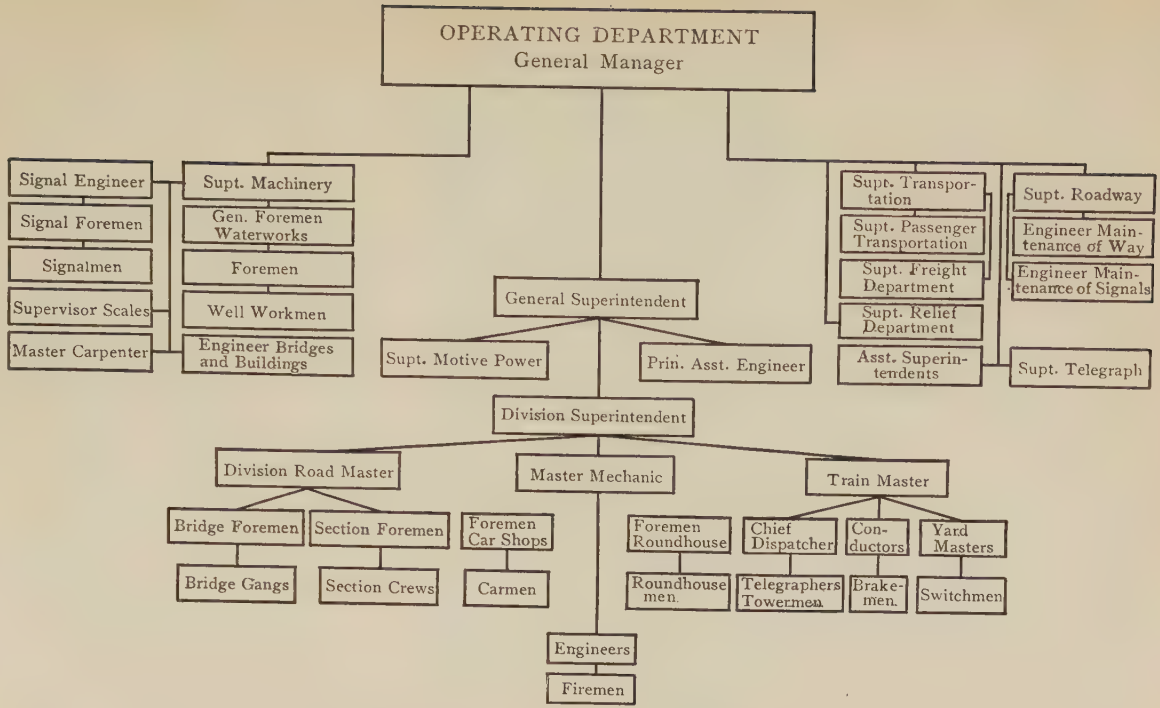
6. Secure if possible from your local railroad company its plan or chart of organization. What titles have the leading officials?

Operating Department

This is the most comprehensive department in railroad organization. Different companies vary somewhat in the way they have organized this department, but the following diagram sets forth the general arrangement. Study this chart with care and find answers to such questions as follow. Who is the chief official? What six executives are responsible directly to him? Over how much of the road has the general superintendent charge?

If an engineer and fireman take charge of their engine at a certain town, they do not run on and on to the end of the line, but stop at the next division point; one division is their run for the day. Here they rest for several hours and then return, hauling a second train back to their home town. This shows how roads are broken up into "divisions." Who is the chief official of the division? Over what subdepartments has he charge? There are three main parts of the operating department, each of which will now be described briefly.

Roadway subdepartment. This is under the direct management of the division road master. As a general rule he



The operating department of a railroad

The railroad company marshals its employees like a great army, each department and each man being assigned definite duties for which they are held responsible

does not take charge of the construction work, this usually being let out by contract and performed by other than railroad employees. The same is true of the driving of new tunnels, the erecting of large new bridges, and, in some cases, the making of new buildings. Consequently boys interested in these forms of construction work should seek a position with some contractor specializing in railroad work.

1. *Work of section and repair men.* The lowest grade of employees under the road master are the section men or track laborers, each gang of whom has charge of keeping in good condition some six to eight miles of track. The section men's pay averages $1.50 and the section foreman's about $2 per day, but in addition the latter receives free of charge a house to live in, fuel, water, and oil for his lamps. His remuneration is thus quite satisfactory. While the work is hard physically, it is out of doors and healthful. The lower positions are generally filled by uneducated foreigners, but most roads employ also promising young Americans as assistant foremen at about $1.75 per day in order to train them for the foremanships. Closely related to the work of the section men just mentioned is that of bridge-repair gangs, ballasting gangs, pile-driver gangs, as well as of those working with concrete, upon buildings, or in the water service. These activities offer good opportunities to learn the more desirable construction work.

2. *Signal maintainers.* The signal department provides work considerably different. For a boy who has an inclination toward electricity this is a good place for practical experience. Signal maintainers average about $70 to $75 a month, and the chances for employment are increasingly good since this department of road service is being steadily expanded every year.

Machinery subdepartment. This is under the direct charge of the division master mechanic. His department includes three different kinds of work.

1. *Duties of car men.* First, the cars must be inspected and repaired. This is the work of car men. When your train stops at division points you hear their hammers tapping on the wheels. After your train leaves they return to the car yards to repair the rolling stock damaged through long use or in wrecks. Their wage is from $2 to $2.40 per day.

2. *Work of roundhouse men and mechanics.* Second, the engines must be housed, inspected, repaired, and otherwise

A railroad roundhouse

The table on which the engines are turned is shown here in the center of the semicircle. Each section of the building is termed a "stall," and this roundhouse will house about twenty locomotives

cared for at the end of each run over the division. This work is done by the roundhouse men, who are so called because their activities are in and about a house built for the engines in a semicircular shape around the turntable. Then there are the services of the machinists, blacksmiths, and boiler makers, skilled workmen, whose trades will be considered in a later chapter. The other employees have no special training. They knock the fire out from the grates

when the engine comes in, run it into the proper roundhouse stall, wash out the boiler, wipe the engine until it shines, and fire it up again when another trip is to be made. There are about 225,000 shop men doing such work, and their average pay is $2.25 per day. Part of this force is on the night shift and Sunday work is common.

3. *Work and advancement of firemen and engineers.* Third, the engineers and their firemen take charge of the engines and haul the trains to the next division point. Some of the firemen get their positions after working in the roundhouse as wipers, hostlers, and helpers, but most of them on the larger roads are either experienced men from other roads or inexperienced men who seem to have the proper qualifications to make good firemen. These latter run for several trips without pay as "students" and then are regularly assigned. It should be understood that for many railroad positions, including that of fireman, an applicant must be twenty-one years of age and able to pass a rigid physical examination, with tests for color blindness, proper vision, hearing, etc.

Firing is heavy work. With the big engines, the long trains, and speed on some roads, it becomes a back-breaking task to shovel enough coal into the firebox. But the hours for the trip are short compared to the long rest periods between, though at times the run may call for night work. The average wage of firemen is about $3 per day.

During the time a man is firing he is studying the locomotive and air brake, so that when the time for advancement comes he can pass the examination on machinery and air braking. After about three years of firing he is usually examined, and if successful is in line for a position as engineer. When there is need of a new engineer the fireman oldest in the service gets the place. If business is good many of the older firemen are put in charge of engines; when traffic falls off they must go back to firing again.

Since promotion is on the basis of seniority, the engineers oldest in the service get the best runs, driving the splendid through passenger trains being the positions of honor. Further promotions may be to positions such as traveling engineer and somewhat infrequently to that of master mechanic. The average wage of engineers is about $5 per day.

A switch yard

Several switching crews are here making up trains. Such work keeps these men regularly at the same town, for taking trains to the next division point is a duty assigned to trainmen, not switchmen

Transportation subdepartment. This is in charge of the train master. He manages the equipment and controls the moving of freight and passengers. This necessitates three kinds of work.

1. *Work of yardmen.* First, the trains must be made up. The yardmaster and his switchman — with the aid of a switch engine, engineer, and fireman sent to them from the mechanical department — rush back and forth upon the various side tracks, signaling, and shunting cars here and

there until at last the train is ready for its trip. The yardmen then go to preparing other trains.

2. *Work of trainmen.* Second, trainmen — a conductor and his brakemen — take charge of the train made up for them by the yardmen and run it to the next division point. The work of switchmen and brakemen, while it is not heavy like the fireman's task, is extremely hazardous. The average wage is about $2.90 per day. After several years of service promotion may be secured to yardmaster and conductor, whose daily wages average about $4.20.

3. *Work of telegraphers and tower men.* Third, since all the trains must be run in proper order if wrecks are to be avoided, a numerous band of telegraphers and tower men are stationed along the line. They receive orders from the train dispatcher, who has his office at the division point and is responsible directly to the train master. The average daily wage of the telegraphers is about $2.50.

Nature of the work; qualifications demanded. In the machinery and transportation subdepartments — in which young men are likely to be most interested — the demand for labor fluctuates somewhat. In the fall and winter months, when business is heavy, well-qualified men have no difficulty in securing employment; but during the dull season there is a surplus of men on the extra list who do not have steady work.

To secure positions in these departments men are required to pass a mental and a physical examination. These occupations require a quick, active mind that can grasp a situation instantly and use good judgment. All men are required to have a common-school education as a foundation, but the work cannot be learned except by actual experience.

That railroad work is dangerous is pretty generally known. "The occupation of switchman is considered the most hazardous in the transportation department of railroads in the United States," writes the International President of the

Switchmen's Union. "The average life of a switchman is about nine years, when he either is killed or has become incapacitated from injury. We pay on an average of one claim every twelve months for every fifty-three members for death or permanent total disability." Some insurance companies

"King of the telegraphers"

This is the chief dispatcher, upon whose orders depend in large measure the avoidance of wrecks and the rapid moving of trains from station to station. He is at all times in touch with local telegraphers along the line

refuse to take the risk on brakemen, conductors, firemen, and engineers at all, while those that do insure these men charge a very high rate.

Other work under the operating department. The above comprises the work which is peculiarly of a railroad nature. The other branches of railroad work are not greatly different from those of commercial business in general. There are also in the operating department, it may be added, a

number of clerical positions, such as timekeeper for the various gangs, clerk in the roundhouse foreman's office or with the master mechanic, train master, or division superintendent. These positions need not be discussed here, as clerkships will be considered in connection with a later department.

Unionization of the operating department. The operating department is thoroughly unionized. Wages are not set by individuals making terms with the company, but by collective bargaining. Representatives from the union and the various railroad companies meet and arrange the wage schedule, hours of work, etc. So important is the transportation service that a widespread strike would be a serious calamity. Hence the government often takes a hand in settling disputes. The operating employees have pressed their claims so well that at the present time few workmen are better paid for their services. This is a point worth considering by the young man who thinks of railroading and has a mechanical bent of mind.

EXERCISES

1. Ask your local section foreman how the track is kept in good condition.

2. Have you a roundhouse in your town? a car-repair yard? a switch engine and crew? a tower man? If so, find out what you can about their work.

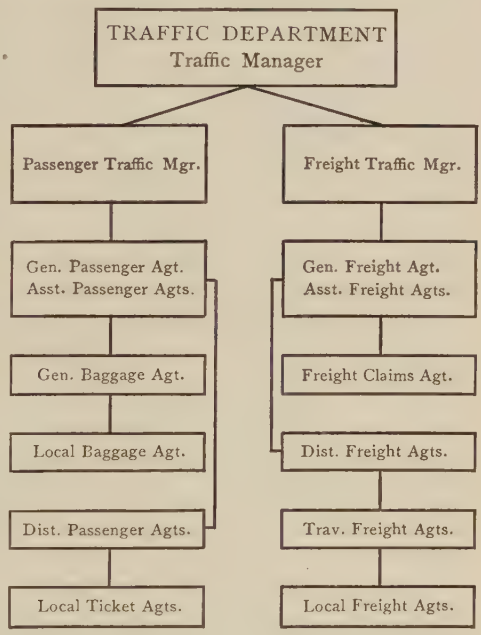
3. If you are acquainted with an engineer, learn what you can of his life-career.

4. If you are acquainted with a conductor, learn what you can of his career.

5. Call upon some telegraph operator. Does he do railroad or commercial work? How did he learn telegraphy? How long has he been in this business?

Traffic Department

A railroad has service to sell. It is upon the persons and commodities transported that its money is made. Needless to say, the traffic department, under whose charge this business is conducted, is a very important part of the railroad organization. The chief official, often a vice president of the company, is termed the traffic manager. The various subdivisions of the traffic department are here shown by the diagram. What two officials are directly responsible to the traffic manager? The work of each will be discussed in turn, and in conclusion three other activities of the traffic department will be pointed out.



Organization of traffic department

The railroad company has transportation services to sell, and this is the organization which deals with shippers and passengers

Passenger subdepartment. 1. *Duties of station agent.* The official of the passenger department with whom you are probably most familiar is the local ticket seller. In small towns he is always found at the station, and in addition to his duties as ticket agent he often has charge

of the freight, express, baggage, and telegraphing as well. But in the larger towns the station agent has several assistants, the man who sells tickets perhaps being a clerk. He may also have his office uptown and carry on his business much like a retail merchant. The average wage of these 38,000 station agents, in small and large towns, is about $2.20 per day. Their assistants, a band about four times as numerous, receive approximately $1.90 per day.

2. *Advancement.* Promotion for the local-station agent may be in assignment to a better station or, in fewer instances, to a district passenger agency. The district passenger agent advertises summer resorts and outings over his road, arranges the trips and facilities for conventions and other special meetings, and keeps his superior, the general passenger agent, informed of the traffic conditions in his district and advised of plans for increasing the volume of business done.

To secure all this information, however, often requires much traveling. Traffic must at times be personally solicited. Hence, attached to the office of the district passenger agent and likewise to the local passenger agents are a corps of traveling passenger agents or solicitors. These men do business in much the same way as any traveling salesmen.

Freight subdepartment. Considerably more important to the company than the transporting of passengers is the hauling of freight. For every passenger riding on the roads in 1912 almost two tons of freight were shipped seven times as far. You may have small consideration for the freighter which humbly sidetracks to let your passenger train go by, yet these red box cars yield a revenue three times as great as the luxurious coaches, the difference in 1912 being $1,295,000,000. The positions in this department, as you will notice on the diagram, are similar to those in the passenger department. But on account of this

enormous volume of business there are excellent opportunities for men versed in the various kinds of rates, the methods of rate making, the forms used in traffic handling, the methods of traffic development, traffic association, pools, and other forms of railroad coöperation. A young man thoroughly trained in these subjects as they apply to railroading is also well prepared to manage the traffic department of commercial and manufacturing concerns.

Advertising. There are a few positions to be had in the advertising departments of railroads. Here of course is required a knowledge of the principles underlying advertising as well as its practical application. But one must also know the commodity to be sold, a knowledge which in this case requires practical experience in railroad work. Hence it is a specialized vocation with attractive openings for the few who are qualified.

Mail service. This work, although under the supervision of the general passenger agent, is carried on under conditions determined by the United States government. The work of the government clerks which most nearly approaches railroading — that is, the work of the mail clerks — will be mentioned in connection with the civil service.

Express service. The express business is also not primarily railroad work, but is carried on under contract with various express companies. In the smaller towns the local-station agent has charge of the express business, for which he receives a commission in addition to his regular salary from the railroad. But in the larger towns and cities this service is carried on as a separate business with a manager, assistants, and delivery men. The competition of the United States parcel post has somewhat lessened the opportunities for young men entering the express service.

EXERCISES

1. Does it cost more or less to ship a five-hundred-pound stove than a five-hundred-pound buggy? Explain.

2. How much per mile is railroad fare in your state? Who decides this rate?

3. What have the passenger and freight solicitors to sell? Are they allowed to make special prices on their commodities to individuals?

4. Name the leading express companies. What can you tell of the way their business is carried on in your town?

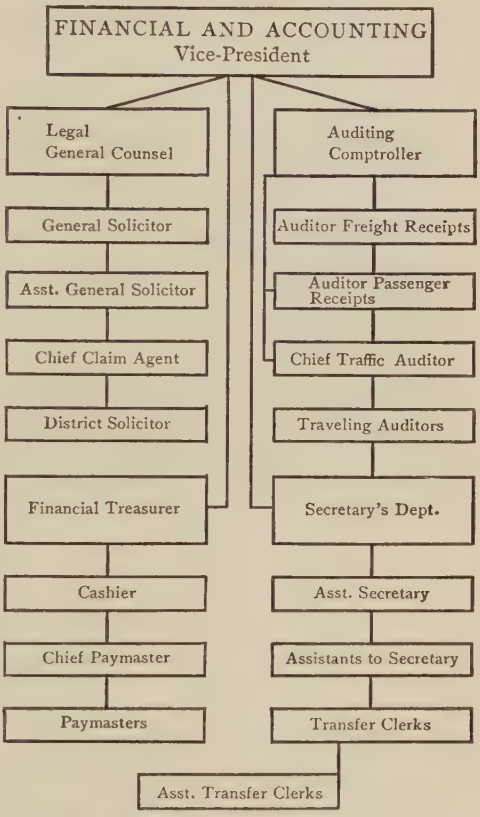
Financial and Accounting Department

The business secured by the traffic department and handled by the operating department must be systematically managed. This gives rise to a variety of work which is intrusted to the department of accounting and finance. Notice in the diagram on the following page how many divisions this department has.

Auditing division. The ordinary business man counts his money when he receives it. But this simple task becomes an elaborate process when instead of the business man we have a railroad company. All tickets sent to the various selling offices are carefully recorded, the local ticket agent's report of sales is checked up with the original list, with the used tickets turned in by conductors at the close of each trip, and with the unsold tickets yet on hand. The freight waybills and the express and mail receipts are similarly checked over. In this way careful record is made of all money received.

The ordinary business man would also count his money as he paid it out. Just as ticket and waybill are the basis upon which receipts are computed, so the voucher is the basis upon which the disbursements are made. No money is paid for materials or wages unless authorized by means of this voucher, which bears the signature of some responsible official.

The head of the auditing division is called the comptroller. This officer has three leading subordinates: the auditor of passenger receipts, the auditor of freight receipts, and the auditor of disbursements. Under them are a number of traveling auditors whose duty it is to check over the books of the local agents along the line. But to do the detailed work at the central offices a corps of clerks is needed, while to handle these vast sums, and from them prepare intelligent statements for the chief officials of the road and for the various reports published by the state and national governments, requires numerous trained accountants and statisticians.



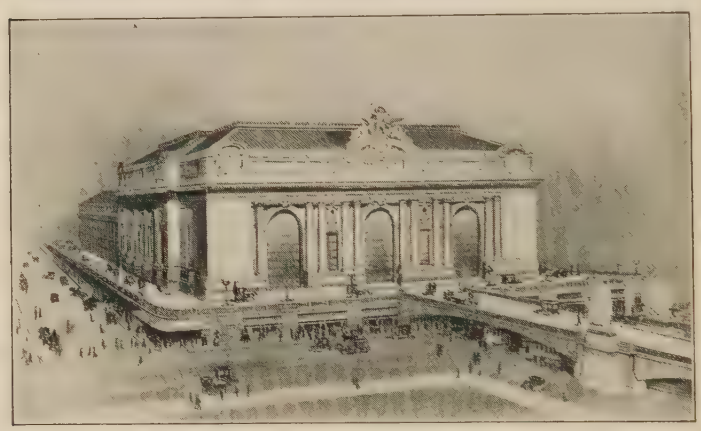
Financial and accounting department

The work done in these departments of a railroad does not differ a great deal from the financial and accounting work of commercial concerns in general

Financial division. Although a record of receipts and expenditures is kept by the auditing division, the money itself is in charge of the financial division.

This is really the banking part of railroad management whose head is the treasurer. His subordinates are termed cashiers, and under them are the officials that the railroad men know best, the paymasters.

Legal division. There are many contracts requiring legal skill; and railroads, like other great business enterprises



A railroad headquarters

In addition to its use as a passenger station, this magnificent building houses the financial, traffic, and auditing departments

find certain legal controversies unavoidable. From the diagram find out who is head of this division. What are his subordinates called?

Secretarial division. A mass of correspondence is carried on between the railroad company and outside organizations and individuals, and also within the company itself. In addition to the correspondence there are also many records to file and preserve. This work is in charge of a secretary, who is assisted by a great many clerks, stenographers, and typewriters.

Altogether there are very nearly 80,000 clerks employed in railroad work, principally in the two departments last discussed, whose average salary is about $2.50 per day.

Auxiliary Subdepartments

There are yet other enterprises in which a railroad engages and which consequently must receive attention somewhere in its organization. But since these are common to many other kinds of business, we shall here merely touch upon the most important of them.

Purchasing subdepartment. Railroads are learning the worth of expert buying. Each department formerly purchased its own supplies, but this plan has now been largely superseded by the more economical one of employing a purchasing agent. He has several assistants, the number depending upon the volume of business, and under them he has also the storekeeper. Unlike most merchants the railroad storekeepers do not sell anything, but distribute supplies upon presentation of the proper requisitions.

Subdepartments in charge of insurance, real estate, and pensions. All companies own some real estate and there is much buying and selling of property, especially with the Western companies, which received large land grants. Two other lines of activity sometimes in charge of separate divisions are insurance and pensions. Naturally, however, the transactions in real estate and the insuring and pensioning of individuals are not general but are strictly limited, the former to railroad property and the latter to railroad employees.

EXERCISES

1. Like what corresponding branch of commercial business is each of the above divisions of railroad work?

2. If you are personally acquainted with anyone employed in any of these divisions of railroading, what can you tell of his position?

How to enter Steam Railroading

It is evident that railroading is a broad field and hence offers a wide range of positions. Directing a shovel gang, running a locomotive, checking up waybills, defending a damage suit, all have a place in railroad work. It is very likely that a young man inclined toward railroad service can find in it some position both congenial and worth while.

Railroads, moreover, are highly organized. The nature of their business requires a somewhat complex organization with men held closely responsible. And the way to learn how to fill an important position, the railroad companies believe, is to fill a minor one of the same or similar kind. This means that the system of promotion characterizes railroads — that men "work up," and that emphasis is laid upon seniority. It means, too, looking at the matter from an individual standpoint that whatever the qualifications of a young man he will probably have to begin in what may appear to him a very humble position.

The way of actual experience. Accordingly, the primary way of becoming fitted for railroad work is through actual experience. But this way is long and it has caused many a bright young man to become a mere cog in the machine. As a railroad expert writes to us, "I have said very little about these openings, as I should hate to advise any young man to bury himself in the accounting department of a railroad. Of course there is opportunity there the same as anywhere else; in fact, there is big opportunity for the right kind of man. But it is mighty mechanical, and unless a boy has all kinds of grit and perseverance he is likely to become an old man and still find himself a clerk."

The apprenticeship system. The second method of securing training is through the apprenticeship system. The young man agrees to work for a certain number of years for less wages than he might otherwise earn, and the

employer in return provides him special opportunities to learn the trade. Apprenticeship on railroads at the present time is generally limited to the mechanical department, because this work is specialized and lends itself best to such a method of learning.

Courses of instruction. The third method is the school, a place where definite instruction is given. Sometimes this instruction is offered by correspondence, the school having no particular connection with the railroad company. At other times the work is done in residence schools, in the various Young Men's Christian Associations, and in certain high schools, as at Fitchburg (Massachusetts) and Altoona (Pennsylvania).

Educational advantages offered by railroad companies. The railroad companies themselves are developing educational work. The Union Pacific Railroad Company, for instance, has an "educational bureau" whose objects are as follows:

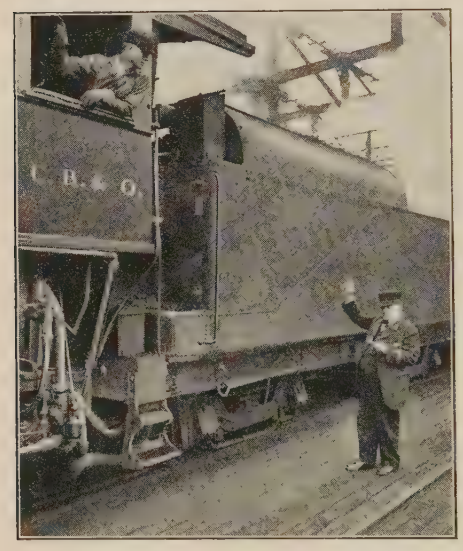
First Object. Assisting employees to assume greater responsibilities. The bureau will offer any employee desiring to qualify himself to assume greater responsibilities a course of reading and study along the line which he may indicate.

Second Object. Increasing the knowledge and efficiency of employees. It is the purpose of this bureau to provide a means whereby any employee desiring information on any particular question or problem met with from day to day can send this question to the bureau for an answer. No limit is set on the number of questions that may be asked, and an employee may ask for information every day, if he so desires.

Third Object. Preparing prospective employees for the service. It is the purpose of this bureau to assist in supplying men of good reputation and character for vacancies and, where possible, to train these men as far as practicable in the duties of their prospective work before their employment.

Improved conditions in railroad employ. From what has been said it becomes evident that entering the railroad employ and succeeding in it as a life-career is a problem

now being vigorously attacked from several quarters. Because of the resulting advantages railroad service will gradually become more attractive to young men of training and perseverance. As is pointed out by a former official of the Lehigh Valley Railroad, "The time will come when railroad employ for *every* man in the service will not mean drudgery, nor sinecure, nor accidental opportunity, but an enlightened, stimulating, highly efficient service of the highest earning power, least uncertainty from accidental causes, largest freedom for individual initiative, entire self-respect, and thoroughly democratic spirit."



Conductor giving engineer the "high-ball"

This conductor came up from the ranks and, as the number of braids on his left sleeve indicates, has been in the service over a quarter of a century. The high standard required in railroad work is shown by the fact that this train, making a daily 1000-mile run, was on time 355 times out of a possible 365

Qualifications. As to the qualities which will bring success in railroad work, perhaps it may be well to consider what President Howard Elliott of the New York, New Haven and Hartford Railroad Company said recently: "The only rule to success that I know of is hard work, honesty, sincerity, good character, and good habits. These are platitudes, but they are the principles of success. Whatever you do, do as well as you can, and do a little more than is expected of you if possible."

EXERCISES

1. Which phase of transportation appeals to you most favorably? Explain why this is so.

2. Tell how you can enter this department.

3. What future do you believe this particular position offers you? How might you secure promotion in this work?

ELECTRIC RAILROADING

Growth and importance of electric railways. You may be surprised to learn that electric railways carry almost ten times as many passengers as do steam railways. The amount received from each passenger is only a few cents, of course, yet electric railways earn in this way almost two thirds the income received from passenger traffic on steam cars. While the growth of cities is accompanied by a steady increase in the number of surface, elevated, and subway lines, one of the interesting developments of rural life is the building of interurban railways. In five and a half years, ending with 1907, the total mileage increase of electric railways was 53 per cent. But the increase of interurban lines was more rapid than that of city lines. Hence the young man who thinks of railroading as a career should by no means neglect considering interurban lines as well as city car systems.

Positions available. The various departments and positions shown in the diagrams of the steam railroad on pages 105, 113, 117, are, with certain modifications, to be found in electric railroads. The average electric line has fewer employees and far less mileage than the average railroad, so its organization does not require the services of so many specialists. But one particular specialist it needs even more than the steam railroad needs a specialist, and this man is the electrician. His profession is treated in a later chapter, but at this point it is well to emphasize that the electric transportation companies have much to offer him.

Pay and promotion of conductors and motormen. Traffic is seasonal, being as a usual thing much heavier in the summer. To prepare for this increased business new men are employed during the spring. When first employed, a man serves on the extra list until vacancies above him, caused either by resignations or increased traffic, leave him a regular run. With the slackening of traffic in the autumn, the new or less desirable men are weeded out.

The following rates of pay for conductors and motormen were in force July 4, 1913, on the New York City surface lines:

RATES OF PAY

First year	24 cents per hour
Second year	24 cents per hour
Third year	25 cents per hour
Fourth year	26 cents per hour
Fifth year	26 cents per hour
Sixth year	27 cents per hour
After ten years	28 cents per hour

By strict observance of operating rules and regulations, employees may earn the rate of the next higher grade one year earlier than the time specified in the preceding table.

EXERCISES

1. What opportunities for electric railway service does your community afford?

2. What are some of the advantages of the motorman's position? the disadvantages? What are some of the advantages and disadvantages of the conductor's work?

INLAND AND OCEAN NAVIGATION

You may live near the Great Lakes, on some navigable river, or in some great seaport. How does water navigation appeal to you? What opportunities are there in it for a life-career? Upon the inland waterways of the United States in 1906 the total traffic amounted to over 100,000,000 tons. Most of this was upon the Great Lakes and the St. Lawrence, but the Mississippi, the Ohio, and the Hudson also have a notable volume of traffic. In addition, our immense foreign trade means important ocean traffic; a greater part of this, however, is under control of foreign shipping companies.

The general organization and operation of inland and ocean navigation is so similar to land transportation that it need not here be further presented.

READINGS AND REFERENCES

Books

CARTER, CHARLES F. When Railroads were New. Henry Holt and Company, New York, 1909. $2.00.

DEWSNUP, E. R., editor. Railway Organization and Working. The University of Chicago Press, Chicago, 1906. $2.00.

EATON, J. S. Education for Efficiency in Railroad Service. United States Department of Education, Washington. *Bulletin No. 420.* Free.

Electric Railway Transportation. Annals of American Academy of Political and Social Science, Philadelphia, 1911. $1.00.

JOHNSON, EMORY R. Ocean and Inland Transportation. D. Appleton and Company, New York, 1905. $1.50.

MCPHERSON, LOGAN G. Working of the Railroads. Henry Holt and Company, New York, 1907. $1.50.

RIPLEY, W. Z. Railway Problems (Revised Edition). Ginn and Company, Boston. $2.50.

SPEARMAN, FRANK H. Strategy of Great Railroads. Charles Scribner's Sons, New York, 1908. $1.50.

Periodicals

Electric Traction. Monthly. Kenfield-Davis Publishing Company, Chicago. $1.00 per year.

Railway Electrical Engineer. Monthly. Wray Publishing Company, Chicago. $1.00 per year.

Railway Journal. Monthly. Chicago. $1.00 per year.

Telegraph and Telephone Age. Semimonthly. J. B. Taltanall, New York. $2.00.

Unions

Brotherhood of Locomotive Engineers. Reports. Cleveland, Ohio.

Brotherhood of Locomotive Firemen and Enginemen. Reports. Peoria, Ill.

Brotherhood of Railroad Trainmen. Reports. Cleveland, Ohio.

Order of Railway Conductors. Reports. Cedar Rapids, Iowa.

CHAPTER VII

CIVIL SERVICE

To the victors belong the spoils. — WILLIAM L. MARCY, in the United States Senate, 1832

A democratic republic such as ours represents the most gigantic of all possible social experiments, the one fraught with greatest possibilities alike for good and for evil. — THEODORE ROOSEVELT at the Sorbonne, 1910

Andrew Jackson swept out of office the men who had served Adams, and filled their positions with political adherents. Term after term that pleasant-sounding but elusive phrase "rotation in office," joined with the foolish belief that all men are equally competent to fill any government position, seduced the American public. Meanwhile machine bosses chuckled and the heads of competent public servants, though poor politicians, regularly fell into the spoils basket. And the public paid the bill in the reduced efficiency of service.

Popular demand for civil service. But it has gradually dawned upon people that after all the government is pretty much like a big business corporation. So much revenue is raised, so much service is rendered. When, as in the year 1913, Congress appropriates $617,382,178 for one year's governmental expense, the American voter begins to consider seriously just how this money is spent. And the American people, whether acting in their federal, state, or municipal capacity, are becoming actively opposed to having a crooked politician present his friends with fat jobs — *and then send the bill to the public.* This awakening means the growth in importance of civil service.

Growth of civil service. The civil-service law was passed in January, 1883, its general object being "to regulate and improve the Civil Service of the United States." Its means for accomplishing this were three in number: First, competent employees for the government were to be secured by examination and appointment; second, removals could not be made for political reasons; third, advancement, like appointment and continuance in office, was removed from political domination by being made dependent on fitness alone.

Such a plan for securing government employees was considered revolutionary, and was for many years looked upon with suspicion. But as the system has continued to work successfully, it has grown steadily in favor. In June, 1912, there were 395,000 persons employed in the United States civil service; and of these, 236,000 held positions subject to competitive examination.

Number of federal positions. The following table lists a few only of the many positions open to young people who are prepared. It also indicates the number of persons examined, passed, and appointed, and their salaries, for the year ending June 30, 1912.[1]

Examination	Examined	Passed	Appointed	Salaries at which appointed	
				Minimum	Maximum
Clerk (departmental)	1806	510	37	$660	$1000
Draftsman	377	92	20	900	1500
Forest assistant	159	91	59	1200	1200
Railway mail clerk	11,266	3034	770	900	900
Scientific assistant	351	154	19	600	1620
Stenographer	879	152	33	700	1080
Stenographer and typewriter	1525	514	417	480	1200
Subclerical	1323	1099	463	300	720
Typewriter	1170	744	307	480	1200
Veterinarian	392	185	109	1200	1400

[1] From Section 278, "Manual of Examinations," 1913.

State positions. Though the federal government is usually thought of when civil service is mentioned, the state governments are also offering more and more opportunities under conditions similar to those of the United States. In New York State, for example, there are over 17,000 positions under the civil service. Among these may be mentioned the positions of accountant, bookkeeper, court attendant, clerk, copyist, engineer, examiner, fireman, game protector, prison guard, inspector, stenographer, storekeeper, and superintendent. The state of Illinois in 1911 examined 2896 applicants, of whom 2262 passed and 1474 were appointed. Illinois also has a long list of positions from which to choose.

Municipal positions. A similar movement for civil-service reform is found in cities. As an illustration of what opportunities municipalities have to offer, the New York Municipal Civil Service Commission conducts examinations for positions in laboratories, hospitals, and asylums, clerical service, engineering, inspection, legal work, attendance service, police, prison, and fire departments, medicine, street cleaning, and ferry service.

Desirability of the different positions. If you do not know whether or not the civil service offers a position which suits you, or which of several positions is the most desirable, write to the United States Civil Service Commission at Washington for their "Manual of Examinations," to your state Civil Service Commission at the Capitol for their "Manual of Examinations," and to the Civil Service Commission in your city for a copy of their manual. Look these through carefully, and you will discover in detail the scope of civil-service work. Indeed, it would seem that among so many different positions open, it should not be difficult to select one worthy of your serious consideration.

EXERCISES

1. What objections do you see to the "spoils system"?

2. Has your state a civil-service commission? What positions do they have to fill?

3. Has your city a civil-service commission? If not, ask some policeman, fireman, or clerk how city positions are secured.

4. How can you find out whether a position which interests you is open for application in the civil service?

Securing a position. If you look through the manuals and select a position which you would like very much, the question arises, How can I secure it? There is no need to look around for some powerful politicians to help you. In this case they are powerless. The proper way to go about securing a position may be illustrated by taking a concrete case, as follows:

1. *Application.* You are a stenographer and typewriter, let us say, and you wish to enter the federal service. You note in the Manual that applicants for a position similar to your present one are to be examined in a neighboring city on a certain date. Possibly you may have gained this information from a printed notice in the post office, since notices of vacancies and examinations in the civil service are always posted in public buildings. At any rate, you write to the Civil Service Commission at Washington, requesting an application blank. When this blank is received, fill it out with care, since it must be complete and just right, or you may be so delayed in correcting it that you will be obliged to wait for a later examination. A card will then be sent you granting permission to take the examination at the place and date specified.

2. *Preparation.* Meanwhile you should be busily preparing to pass this examination successfully. You turn to Stenographers and Typewriters Examination in the index of the "Manual of Examinations" and, by consulting the

pages referred to, you note that the first subject required of applicants is stenography dictation. You find there a discussion of what this examination is like and a dictation similar to that which later you will be called upon to take. You note that the second requirement is correctness in copying and spacing; the third, making a good copy from a rough draft; the fourth, making a good copy from a plain copy; the fifth, the time you take in doing this typewriting; the sixth, showing proficiency in other subjects. In turning to the section to which reference is made, you see that you will be examined also in spelling, arithmetic, penmanship, geography, and the civil government of the United States. In making preparation for this examination you may be aided somewhat by knowing how the papers are marked. In the Manual you will find sections which explain how this is done. With these points of information as a guide, make your preparation. And on the date set for the examination appear in good physical condition and do your best.

Chances for appointment. 1. *A high examination mark.* If your papers when graded average less than 70 per cent, your application is rejected and reëxamination is your only hope. But securing a grade of 70 per cent or over places you on what is known as the eligible list, and when a vacancy for a stenographer and typewriter occurs, the three names highest on this list are submitted to the appointing officer. He selects the person in his estimation best fitted, and the other two names are returned to the register to await the next appointment. The main thing, therefore, is a high examination mark.

2. *The number of applicants from your state.* There are additional factors which may increase your chance of appointment. One is whether or not there are many from your own state seeking positions. Each state has a certain share of appointments apportioned to it. Persons from

extreme Southern or Western states have better chances, for often these states — being so far from Washington that young people do not seek work at that distance — do not furnish enough eligibles to secure their share of appointments. On the other hand, if you live in Maryland or Delaware and want a position in Washington your chances are not so good.

3. *Willingness to work in distant sections.* Another factor affecting your chance of appointment is whether you are willing to work in distant sections. A stenographer and typewriter who would accept an appointment in Washington, on the Isthmus of Panama, or in the Philippines would be more likely to be placed than one who would go only to Washington.

4. *Qualifying also for state and municipal positions.* Another thing you can do, in case you desire an appointment at the very earliest possible time, is to take similar examinations for state and municipal civil service. Then whichever position was first tendered could be accepted. Still another plan is to qualify for more than one position. If you pass the stenography and typewriting examination, you thus become eligible for an appointment as stenographer or as typewriter. Or you can take a second examination for field service, and thus widen your chances of appointment.

5. *Qualifying for more than one kind of position.* All these plans apply even if you have only one type of qualifications, such as those required for stenography and typewriting. But perhaps you are equally well prepared for two different positions. Or you may be undecided as to which position to select for preparation in the examinations. In this case the results shown by the commissioners in their manual will be helpful in pointing out in which position prospects are best. Suppose, for instance, you live in Illinois and are interested equally in entering the Indian service as teacher or the departmental service as clerk. The manual

for 1913 shows that 84 took the examination for teacher, 57 passed, and 29 were appointed, while the numbers for departmental clerk were 1806 taking the examination, 510 passed, and 37 appointed, so that this position is much less encouraging in its prospects of appointment.

Distribution of national civil-service positions. The following table, which refers to male employees only, will indicate the various departments of civil-service work, the percentage employed in each, and the place of employment.[1]

Character of Work	Per Cent of Distribution	Location of Position	
		District of Columbia	Elsewhere
		Per Cent	*Per Cent*
Executive	1.2	35.4	64.6
Professional, technical, scientific	5.5	22.8	77.2
Clerical	67.2	6.1	93.9
Mechanical	4.9	33.9	66.1
Subclerical and manual labor	18.0	16.5	83.5
Miscellaneous	3.2	1.8	98.2
All classes		10.5	89.5

In which division are most positions to be had? If you did not specify the location, would you be likely to be employed in Washington, or elsewhere? What per cent of the professional, technical, and scientific employees are stationed outside of Washington? What per cent do they form of the total number of employees? What per cent of the entire civil-service force is stationed in Washington?

The foregoing explanations indicate that there is considerable red tape in connection with securing a civil-service position, and that it requires some little skill to plan the whole matter and, especially, to get the high examination mark. For this reason you will find it well to study with care the "Manual of Examinations" and to read

[1] Compiled from Tables 11 and 12, *Census Bulletin 94*, 1907, pp. 22–23.

as many as possible of the references listed at the end of this chapter. If your preparation has been poor or was made some time ago, it may be advisable to attend for a short time some civil-service school or take courses from some correspondence school. These schools have no connection whatever with any civil-service commission, — be suspicious of one that makes such claims, — but they follow closely the past examinations and appointments and can do much to prepare you well. The safest plan in selecting a good school is to find out from some person who has already profited by its coaching, or to write to several of these schools, and decide upon the one which is able to furnish the most solid proof of its reliability. Do not waste time and effort on a poor one, no matter how inexpensive its instruction may be.

EXERCISES

1. Which of the civil-service positions listed interests you most?
2. In what subjects does it require an examination?
3. In what specific ways can you prepare for this examination?
4. How many took the examination last year? How many passed? What number were appointed?

WHAT CIVIL-SERVICE WORK IS LIKE

Once having secured a federal position, you begin work for "Uncle Sam," who you will find aims to be a good employer. He does not always succeed in this, of course, else everybody would be seeking civil-service positions. So, let us consider a few of the pros and cons of government work.

Stability of employment. Government work goes on summer and winter; there are no shutdowns for repairs, no holiday rushes. Only in a few special cases, as the decennial census taking, are fluctuations to be found. Nor are the civil-service employees discharged without cause at

the whim of some foreman or factory owner. Hence we conclude that this work is regular.

Hours of work and absences. The day's work is relatively short, too, seven hours only being required. Employees may be called upon to perform extra services in times of special need, though this is seldom required of them. Thirty days' leave of absence per year with pay is usually granted. This vacation time may be taken a day or two at a time or consecutively, and in case of sickness leave with pay may be extended thirty days more. These three things make the hours of work and the absences very favorable indeed.

Salary. By comparing the list of salaries given in the Manual with those offered by commercial concerns, it will be seen that government work clearly has the advantage. Clerks entering on salaries of from $660 to $1000 are better paid than similarly qualified clerks in dry-goods stores or banks. The minor executive positions, to take another example, such as chief clerk, office manager, inspector, etc., bring salaries from $1800 to $3000, several hundred more than may be expected in wholesale houses or factories.

Advancement. Government work is on a carefully graded advancement basis, and higher positions are usually filled from the ranks by promotion. But here we find no big prizes to tantalize men, none such as fall to the prëeminently successful lawyer, merchant, or manufacturer. Government employees are beset by an abundance of red tape, which not only is wound around packages but also ties up men's minds. Many clerks settle down to routine work and soon seem unable to resist the pull of the dead level. Hence government work is liable to be far behind the times, and the man who has been long in it runs the risk of becoming unfit for anything else and is often unable to hold his own in the swiftly moving commercial currents.

Civil-service positions as stepping stones. To truly ambitious young men, however, there is no need of fossilizing

in Washington; it is a splendid place to prepare for a profession. The short working day permits these young men to spend many spare hours in studying law, medicine, finance, politics, engineering, chemistry, etc., preparing themselves for a professional or business career. "The educational advantages that Washington offers," says the *Forum*, "are not to be left out in a consideration of the opportunities in the civil service. Positions are often sought and obtained for the express purpose of securing means of earning a livelihood while prosecuting professional or scientific studies at the Capitol. The law and medical departments of Columbia, Georgetown, National, and Howard Universities have had their courses and hours of instruction especially arranged so as to accommodate students employed during the day in the executive departments. The Corcoran Scientific School of Columbia University, which offers courses to graduate as well as to undergraduate students, was started in order to supply the same demand. Several hundred young men and women graduate annually from these schools. Former department clerks who are successfully practicing the legal and medical profession in every state and territory testify to the educational opportunities to those engaged in the civil service."

An example of such advancement is seen in the career of George B. Cortelyou, who was once a stenographer in the Post Office Department on the usual beginner's salary. He was steadily promoted, finally became secretary to President Roosevelt at $5000 a year, later served as Secretary of Commerce and Labor at $8000 a year, and after filling successfully two other cabinet positions accepted the presidency of the Consolidated Gas Company in New York.

Young men of initiative, however, do not need to leave the civil service to seek a career elsewhere. Government activity in this era of the new nationalism and the efficiency movement is widening its scope and improving its methods

of work. In several lines there are good opportunities, among which we shall treat briefly the following.

Experts in administrative methods. The work done by the production expert, or the efficiency engineer, needs to be done in government circles as well. President Taft instituted many reforms by means of his Economy and Efficiency Commission. If standards set by this commission are followed up as they should be, clerks who study better methods of getting results will be welcomed and promoted.

Employees in business, railroading, and finance. The last few years have witnessed a great deal of activity in trust regulation, railroad and financial investigation. Men trained in business methods, corporation accounting, banking, and stocks are finding good openings. And they will continue to find such openings, for this work is steadily increasing.

Engineering and technical positions. As an illustration of positions which the Civil Service Commission at times has at its disposal, we may note this announcement in the *Railway Journal*:

POSITIONS FOR MECHANICAL MEN

Editor *Railway Journal*:

The Commission incloses herewith copies of announcements of examinations to be held for filling positions in the Interstate Commerce Commission under the act providing for the valuation of the property of carriers. The examinations to be held are as follows:[1]

Necessary expenses when absent from headquarters in the discharge of official duties will be allowed. It will be noted that positions for which the salaries are $1800 or more do not require the applicants to assemble at any place for examination.

JOHN A. McILHENNY
Acting president, United States Civil Service Commission
Washington, D.C., June 12, [1913].

There are also positions for engineers in the geological survey and the coast and geodetic survey, as well as work for mechanical men other than the valuation of the

[1] See table on next page.

Examination	Salary
Senior structural draftsman	$1800 to $4000
Senior mechanical engineer	$1800 to $4800
Senior railway signal engineer	$1800 to $4800
Senior electrical engineer	$1800 to $4800
Senior inspector of car equipment	$1800 to $3600
Senior civil engineer	$1800 to $4800
Senior inspector of motive power	$1800 to $3600
Senior architect	$1800 to $4800
Architect	$1080 to $1500
Inspector of motive power	$1200 to $1500
Civil engineer	$720 to $1500
Inspector of car equipment	$1200 to $1500
Electrical engineer	$1080 to $1500
Railway signal engineer	$1080 to $1500
Mechanical engineer	$1080 to $1500
Structural engineer	$1080 to $1500

property mentioned in the above quotation. The Department of Agriculture offers many opportunities for young men well trained in science.

In the consular service. The consular service possesses an ideal merit system, and has many other interesting features in addition to the salary, which ranges from $2000 to $12,000 per year. But "our diplomatic and consular service," says Congressman Fowler, "is still the football of politics, and many a good man and trained servant is compelled to make way for some less competent successor whose assistance in the presidential campaign was the price paid for his claim to the place." This situation, however, is being improved gradually. To the young man who wishes to advance, a consul's position is surely desirable, and the time will come, it is hoped, when only trained men, basing their appointments on merit, will hold these places.

In the field of statistics. The government is collecting a vast amount of data regarding our national wealth, the movement of immigration, the relations between labor and

capital, etc. These data must be analyzed, classified, and appropriately presented. This is the work of the statistician, who needs a thorough grounding in statistics, mathematics, and the broader aspects of his work as presented in economics and sociology. Such a man should preferably be a college graduate, who during his course has specialized in these subjects and later has conducted some field investigations. As good a way as any, perhaps, is to begin as a census enumerator. The statistician's salary ranges from $1200 to $3000 a year.

These are merely a few of the many positions now available, a number which will constantly increase. The federal government and the various states and municipalities are enlarging their functions in the service of citizens. The demand for efficiency voiced by these citizens can be satisfied only by trained men, and civil service is the way to secure them.

EXERCISES

1. Draw up a list of all the civil-service positions held in your town.

2. Interview some civil-service employee. Find out what you can about his work.

3. Why are government employees more liable than others to get into a rut?

4. Discuss the work of President Taft's Economy and Efficiency Commission.

5. If you are personally interested in making government work a stepping stone to some more desirable vocation, how could you do this?

6. What opening, if any, does the government offer which interests you as a life-career? What do you regard as most desirable about this particular position?

READINGS AND REFERENCES

Books

FOLTZ, E. B. K. Federal Civil Service as a Career. G. P. Putnam's Sons, New York, 1909. $1.50.

FOWLER, C. N. Public Service. In Careers for the Coming Men, pp. 171–178.

GARFIELD, JAMES R., editor. Public Service, Vol. VI. Young Folks' Library. Hall and Locke Company, Boston. Sold in sets of ten volumes.

Manual of Examinations. United States Civil Service Commission, Washington, D.C.

Manuals of Examinations of your state and municipal civil service commissions.

Report of United States Civil Service Commission, Washington, D.C. Annual.

Reports of your state and municipal civil service commissions.

Periodicals

The Chief. A weekly periodical devoted to the civil service. Publishes notices of examinations and lists of test questions and books designed to prepare students for various positions. New York. $2.50 per year.

Army and navy information may be obtained from their respective departments upon request.

CHAPTER VIII

MANUFACTURING

What a plastic little creature man is! so shifty, so adaptive! his body a chest of tools, and he making himself comfortable in every climate, in every condition. — EMERSON

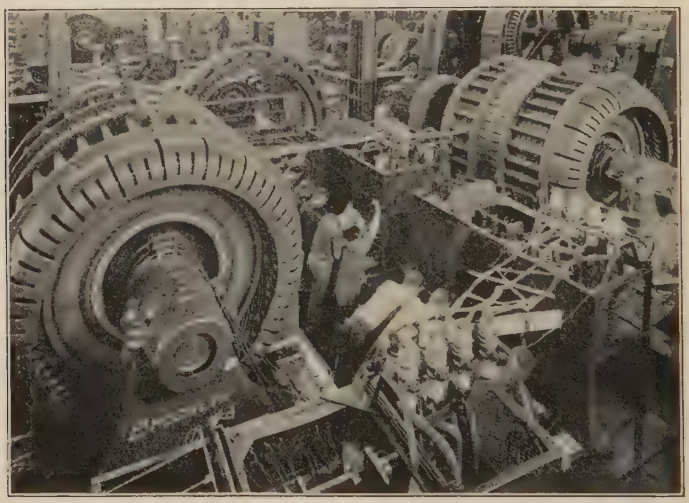
For every wage earner employed in 1909 the value added to raw products by manufacture was $1291. — Abstract from the thirteenth census

Importance of modern manufacturing. Every morning all over the civilized world factory whistles blow. At the same time such an immense multitude assembles that were all American manufacturing employees to stand one behind the other, hands on shoulders, they would form a human chain two thousand nine hundred miles long. These American workers turn out annually a product whose value expressed in silver dollars would, if laid edge to edge, make a silver sidewalk four feet wide reaching five times around the earth.

So progressive are our industries that this enormous annual product of more than $20,000,000,000 represented an increase of 40 per cent between 1904 and 1909. What inconceivable sum may it become when you are mature men, for the manufacturing industry is not yet old! When your grandfather was a boy, if the meat supply ran low they butchered a hog or a beef, salted down part, sold part to the neighbors, and then had fresh meat for several days. But now hogs and cattle are shipped to the great stockyards, which are lined with huge packing houses, and the meat-packing industry heads the list of factory products.

Beginnings of manufacturing. There was a time when manufacturing was mainly women's work. The savage brave shot the deer; his squaw removed the skin, tanned it,

and made the moccasins. Likewise, while her lord was out upon the warpath, she gathered various seeds and crushed them in a mortar, thus laying the foundation for our great milling industry. But after a time, when hunting became poor and enemies grew peaceful, all the members of a family joined in working up their products for use. They



Factory work

Students learning at first hand how to manufacture electrical apparatus

made shoes from hides, wove cloth from fibers, shaped reeds into baskets. And thus the home became a factory.

All this work was done by hand. There was no machinery and only a few simple tools. Boys who study Latin can see how the word " manufacture " (*manus*, the hand ; *facere*, to make) tells the tale. But after many years there came a great change. Let us turn to England, where this domestic system, in operation for centuries, at length underwent its mighty transformation. Owing to the invention of the spinning jenny by James Hargreaves, in 1764, and the

improvements made by Arkwright and Crompton, spinning came to be done by machinery. Weaving too was removed from the control of the hand worker by Sir Edmund Cartwright's power loom. The steam engine, able to furnish abundant power, had been so perfected by 1784 that it could be used for factory purposes. So quickly was the transforma-

Interior view of a modern factory

An example of specialization of labor and large capitalization. This particular factory is engaged in making electric locomotives for railroad use, especially in tunnels and city terminals

tion brought about that in some twenty years all the essential inventions were made, and manufacturing began to leave the homes, to be done in big buildings with expensive machinery and strong engines. Thus was born the modern factory system.

Nature of modern manufacturing. Very little manufacturing is now done outside of factories. Instead, the hand workers have long since left their looms and spinning wheels, and are marching to the factories daily — a peaceful army

6,000,000 strong. No one of them makes an entire shoe or an entire book. An intricate division of labor has been developed, so that each worker specializes on one process. The young man who wants to enter factory work will find few all-round jobs. He will very likely be required to specialize so as to do some one thing well.

He will find also that manufacturing companies are becoming larger and larger. For instance, the amount of capital invested in manufacturing during the ten years from 1899 to 1909 increased 105 per cent, but the number of establishments increased only 29 per cent. And while corporations numbered only 25 per cent of all the manufacturing establishments in the United States, still they employed 75 per cent of all wage earners. What does this mean to an interested young man? It indicates clearly that it is much harder for him to-day to become an independent manufacturer than it was for his grandfather.

The prospective manufacturer may have some special advantages in entering his life work, such as living in a manufacturing center; or he may possibly have the ability to develop a special product from the ground up, as young Charles Hart did in becoming the largest builder of gas tractors in this country. While the young man planning to be a manufacturer may have it in his ambition to be an independent owner some day, for the present he must start near the bottom and learn the business, and he naturally wants a position with some well-established company. This raises the question, What sort of factory work is most attractive?

EXERCISES

1. Learn from some old man how manufacturing was carried on in his boyhood.

2. Do you know any community where this old-time system is still followed? (See *World's Work*, Vol. XIX, p. 12704.)

3. Tell of the early history of the steam engine.

4. Select some line of manufacturing of particular interest to you and find out something of its historical development.

5. Would you call your community a manufacturing center? What different commodities does it manufacture?

6. What is meant by "division of labor"? Visit some factory and observe it in actual operation.

WHAT WORK CONNECTED WITH MANUFACTURING IS MOST ATTRACTIVE?

A manufacturing establishment, like a railroad or a wholesale house, is a complex affair with many kinds of work to be done. The young man may be mystified by its organization and uncertain as to what part is best for him. So let us simplify matters at once. Broadly considered, there are two main lines of activity: the production of goods and the selling of them. The manufacturer who can produce cheaply and sell profitably has done all that any good factory owner desires. But to do this, of course, requires organization. Let us look first at the commercial or selling end of the business.

The Commercial Department

Here you will find an organization very similar to any commercial concern, though modified somewhat to meet the needs of the factory. For instance, the salesman for a packing house or steel plant performs very much the same sort of work as does a salesman traveling for a wholesale grocery house or one selling town lots. Consequently, the prospective factory salesman can read with profit in Chapter V, Commercial Occupations, the section on the selling department. He will also find at the end of that chapter a list of books that will prove of great value to him.

Yet it must be emphasized that these positions should not be overlooked merely because they are not treated again in this section. While all factories need bookkeepers and stenographers, many offer positions as accountants, secretaries, and salesmen quite as good as in any strictly commercial organization.

The Production Department

It is on the production side of the business that manufacturing in its strict sense takes place. Perhaps you think that here every man wears overalls, handles big wrenches with greasy hands, and is making something. But production is a complicated process and covers a wide range of activities. The beginner is apt to be surprised at the great amount of work necessary in order to get ready to manufacture. There are three general lines of activity: preparing for manufacturing, the manufacturing proper, and caring for the product when made. The diagram which follows indicates broadly the scope of production. Each division will be discussed in turn, but parts of them only briefly, since the work of these parts is treated in greater detail under Chapter X, The Machine and Allied Trades.

Designing. This division is in charge of a chief designer and as many assistant designers as are necessary. It is a work which requires (1) extensive knowledge of trade conditions, how to appeal to customers by a new-shaped shoe or automobile; (2) technical skill, the means by which the design can be realized through labor and machinery; and (3) initiative, the ability to strike out boldly, though sanely, on new lines. Such qualities, if of a high order, — especially the productive impulse, or initiative, — are rarely found combined in one person. Good designers consequently command desirable working conditions and large salaries.

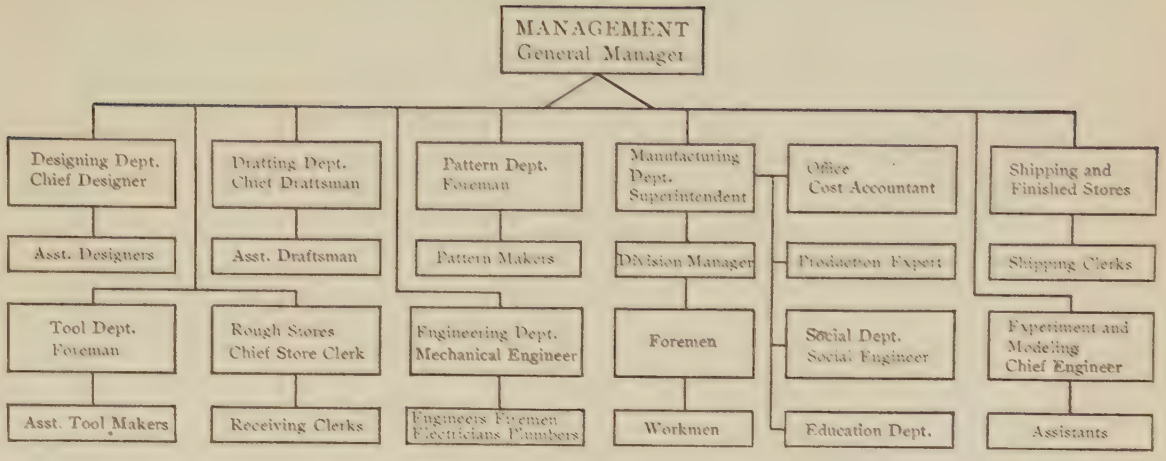


Diagram of the production department

By commencing at the left of this chart and noting in turn each kind of work done by the workmen mentioned, you may follow the main processes of manufacturing a commodity, from the time it is first designed until it is packed ready for transportation to the customer

Drafting. The designs are turned over to the drafting division, where working drawings or blue prints, as they are called, are prepared. This work — if the factory is large and many different products are turned out, for each of which new drawings must be prepared — requires a chief draftsman and several assistant draftsmen. It is a vocation requiring qualifications much more limited than does designing. Many so-called designers, in fact, are really only good draftsmen.

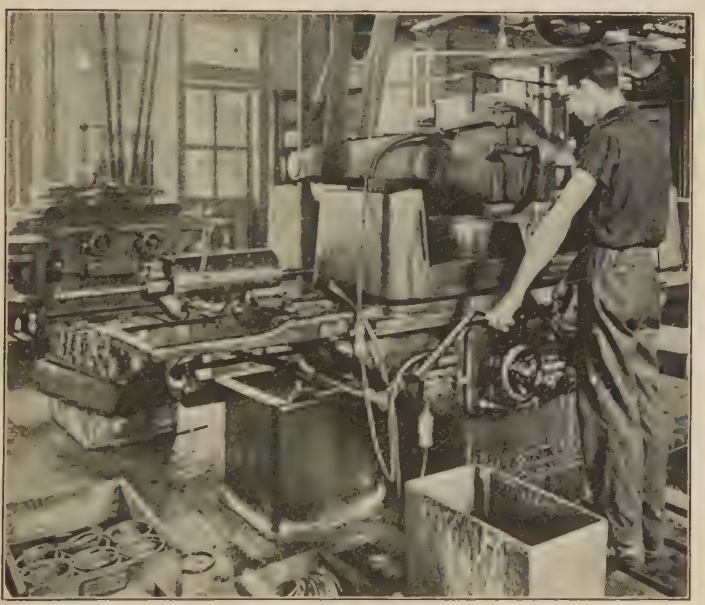
Pattern making. When the design for the proposed product has been approved and the blue print made, the next requirement is the patterns. This division is in charge of a foreman and whatever assistants he may need.

Tool making. The new pattern may call for new tools, the making of which is a highly important task when large orders are received requiring intricate processes of manufacture. The foreman and his assistants may construct the tools, but if the task is too difficult for them they will receive help from others, especially the designers.

Store room. A constant supply of materials from which to make the articles must be on hand. These materials when received are checked up by the chief stores clerk or his assistant clerks. They check out materials as needed upon receipt of proper requisitions. A large shoe manufacturing company in St. Louis gives its beginning clerks $15 per week; when experienced, $20 to $25; and the chief storekeeper an annual salary of $1560. A leading automobile firm in Detroit pays 25 cents an hour to start, 30 cents an hour as the average, and $20 to $25 per week to the stores foremen.

Engineering. To set and maintain the factory in operation requires power, lighting, ventilation, and sanitation. These are the duties of the mechanical engineer. He has for his assistants the engineer, firemen, electrician, plumber, and so on.

Manufacturing. This is by far the largest and most important division of production. Many factories require no pattern maker, have no tool room, and employ no designer. But no factory operates without a manufacturing division. The chief official in charge is a superintendent, who directs several lines of activity, which will be presented in order.



Operating a disc grinder

This workman is preparing piston rings for use in automobile cylinders. The high efficiency of our touring cars and trucks is dependent in large measure upon the intelligence of men such as he

1. *Wage earners.* In this subdivision are found the workers themselves, a vast army of 6,600,000 wage earners. They perform all sorts of tasks, from pouring metal, grinding plowshares, and killing beeves, to cutting cloth, sewing shoes, and printing books. Part of these workers are entirely unskilled, and upon them the burdens of industry

bear heaviest. Their hours per day are the longest, their earnings per year the lowest, and, owing to the unhealthful surroundings in which they frequently work, their life careers the shortest.

Such evil conditions have not prevailed for years, however, in many of our factories. Manufacturers in large and steadily increasing numbers have been providing sanitary buildings, with improved lighting and ventilation and often equipped with comfortable lunch rooms. Best of all, these manufacturers have been joining with the trade unions and the state in passing legislation which requires all factories to maintain that standard of working conditions demanded by public opinion.

More than this is the changed character of factory work. The low opinion of wage earners held by some whose knowledge of factory work is limited would be considerably changed were these people to visit a number of representative plants. Wage earners will be found there in large numbers doing work requiring a high degree of intelligence, and if one engages them in conversation he will find them not only thoroughly trained in their particular tasks but well informed on topics of general interest. Such workmen prove to us that our manufactured products can be made under conditions which cultivate not merely the muscles but the minds of men as well.

2. *Foremen, managers, superintendents.* Here and there we find a workman who shows a better grasp of factory processes than do his comrades, has ability to direct others, and is more loyal to the company's interests. He is likely to be promoted to the position of foreman, or, if these qualifications are developed to a higher degree, to manager of some room or department in the factory.

Foremen, as might be expected, receive better salaries than the general wage earners. Although no general statistics have been gathered by the United States Census Bureau,

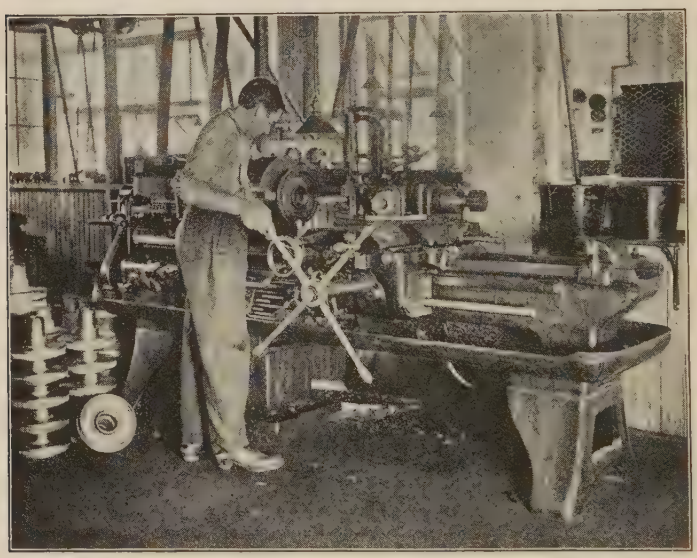
a number of typical manufacturing concerns have told us what their salary schedules are. The lowest wage paid foremen in any of these plants is $20 per week; the highest, $45. The annual earnings reported to us indicate that foremen receive about $1500.

Those who have charge of a department in the factory, such as erecting shop, tool shop, power house, foundry, etc., and whose title is division manager, superintendent, or head foreman, receive from $30 to $55 per week, an annual wage indicated by our data of about $2000. Should a division manager work up to the next higher position, that of directing the work of the entire factory, his salary will be from $35 a week, the lowest reported to us, to $10,000 a year, the highest shown by our returns. The average man can expect from about $1800 to $3000.

If a young man aims for an executive position he would do well to become for a while a workman in the ranks. In the meantime let him be observant and give himself seriously to the problems of the production expert, which will be discussed next. The books cited in the Readings and References at the end of the chapter supply information of great value to every prospective foreman, manager, or other executive.

3. *Production expert.* The production expert is a comparatively new worker. The old-time factory management never thought of employing his services. The need for such services to-day, however, is being recognized everywhere. "During the past twenty-five years," says Dr. Brisco, "American industrial and business life has undergone many changes. Increased competition cut profits to a narrow margin, and in order to lower costs, the managers have been driven to a study of factory conditions. The factory, therefore, is to-day the center of investigation and study. The wastes of time, energy, and materials revealed by this study amazed even the most successful managers. Efficiency,

the modern watchword, demands organization, system, cost accounting, coöperation, and coördination, and touches business activities outside the factory, as advertising, buying, and selling. No branch of industry has escaped investigation, and the result is a great awakening to the lack of method and system."



Studying a turntable lathe

This production expert is testing a new machine under various conditions of speed, hardness of metal to be worked, and the amount of metal to be cut at each revolution. His investigations completed, he will have all the machines in this shop run according to the rules he has deduced

To see that the work of the factory is efficiently conducted is the work of the production expert. He is trained in scientific management. He gathers from every possible source all the information he can regarding the ways of doing some particular task and then proceeds, like a true scientist, to determine the one best way. He next teaches the workmen this one best way. Finally, he places as much

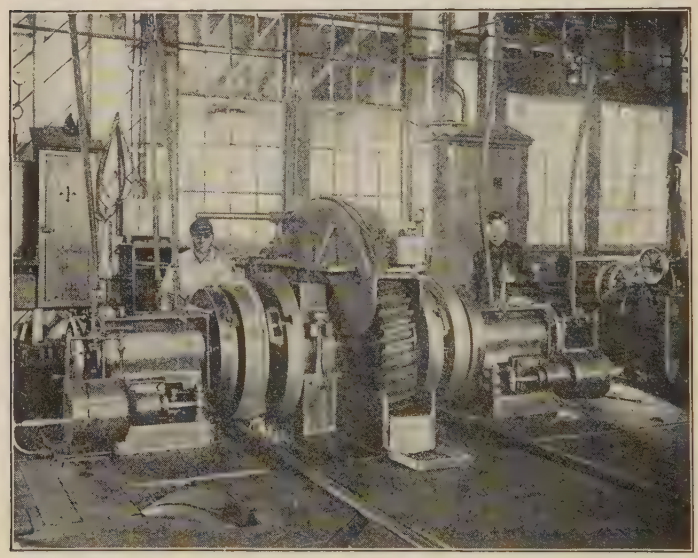
as possible of the work upon the office instead of upon the workmen. For instance, a production expert figured out to a nicety just how to assemble an engine, even to the exact number of turns to give each bolt. After this, instead of letting each workman experiment for himself he had the office typewrite his directions and furnish carbon copies to the men.

A good production expert is a valuable man and is paid accordingly. As might be expected there are a number of these "business doctors" whose services are worthless and who tend to bring the profession into discredit. The leading ones are not employed continuously by any one firm, but maintain offices from which they make calls, as a physician would, upon firms in need of their skill. But here is a point you should never forget even if you have no intention of making this your sole calling — every executive needs to be somewhat of a production expert. A broad, well-balanced, analytic mind, some technical education, including a study of the books listed at the end of the chapter, will go far toward making you a production expert in fact, whether or not you ever adopt the title.

4. *Cost accountant.* Manufacturers formerly had no exact knowledge of just how much their production costs were, relying instead on experienced guesswork. But such haphazard methods are fast passing away. Manufacturers are keeping careful account of the cost of materials, labor, and overhead charges, in this way basing their success upon science instead of luck. To devise plans for accomplishing this purpose is the work of the cost accountant.

It may seem at first that the cost accountant is merely a bookkeeper. While it is true that a knowledge of bookkeeping and accounting is fundamental in his work, it is also true that the profession of cost accountant has been developed rather by production experts than by bookkeepers. To enter this field, consequently, a knowledge of general factory

conditions should be gained. This knowledge can be secured in one way by working for a time in different factory positions. Added to this should be some knowledge of efficiency and accounting, which can be gained from the books mentioned at the end of Chapter V and at the end of this chapter.



A factory process requiring trained men

These men are turning wheels for railroad car trucks. They must be carefully trained, since they have charge of expensive machinery and must produce the full day's quota of fifteen pairs of wheels without injury to the machine or spoiling the work

5. *Office employees.* To perform the clerical work for the production expert and the cost accountant, as well as to handle all the various records which are entailed by the regular run of factory work, numerous clerks, bookkeepers, stenographers, and typewriters are required. This work is so similar to that discussed under this head in Chapter V that no further discussion is required here.

6. Educational and social workers. High-grade employees only can perform the efficient work demanded in many factory processes. Since skilled workmen are scarce, employers, in order to meet the demands, are in many cases developing men of their own by means of apprenticeship schools. As an illustration of what such schools are doing, the Westinghouse Electric and Manufacturing Company has a training school for apprentices, a technical night school, and a course of training for technical graduates. In the course for apprentices the trades of machinist, pattern maker, tool maker, and electrician may be studied. The course covers four years, part of it being shop work and part class work. The shop work is supervised by a shop instructor with several assistants, and for the class work there are fifteen teachers.

As an example of work somewhat less definitely educational, the activities of the Dodge Manufacturing Company of Mishawaka, Indiana, may be cited. Their heads of departments are supplied with books and magazines bearing on economics, mechanics, and engineering. Daily papers, current books, encyclopedias, and books of reference are placed on the library shelves. Weekly meetings are held at which papers are presented and discussed. What the Dodge Company does for its department heads, other companies attempt to do in a more limited way for all their employees.

Another line of work includes recreation as carried on by clubs, athletic teams, smokers' conferences, dramatics, field days; hygiene, the movement for better light, more air, purer water, laundries, bathrooms, rest rooms; and mutuality, as seen in benefit associations, good-will associations, pensions.

In pushing to the fore all such activities, there has been developed a new profession — that of the social engineer. He needs to be thoroughly grounded in practical sociology and to have some training in biology (especially hygiene),

a first-hand knowledge of factory conditions, and the ability to work with men. There are few such positions available as yet, but there are also few men thus qualified.

Finished stores. When the manufacturing division has done its work on the raw materials, they are sent to the finished-stores room. Sometimes they are to be kept here until called for by the assembling room, the finished pieces being sold not individually but as one completed machine. In this case the head of the division is called the chief stores clerk. At other times the product when first sent to the stores room is completed, and in this case the head of the division is more likely to be called the chief shipping clerk.

Experimental worker. A live manufacturer ever seeks to improve his product. He cannot wait for outsiders to come to his office with new inventions, but employs an inventor who sets about producing new ideas in a business-like way. Needless to say, the requirements of this man, the chief engineer, are not widely possessed nor have schools yet learned how to develop them satisfactorily. But a technical education, familiarity with commercial demands, and initiative are qualifications of value.

EXERCISES

1. Have there been strikes in your local factories?

2. Interview some factory foreman. Learn how long he has worked in factories, what salaries he has received, and what are his present duties.

3. In the same way interview a head foreman or division manager; a factory superintendent.

4. The production expert is sometimes called an efficiency engineer or business doctor. Who are some of these men? (Their cards and advertisements appear in business and manufacturing magazines.) Are any of them located in your city?

5. Find out what you can of Frederick W. Taylor, the famous production expert; of ex-President Taft's Economy and Efficiency Commission.

6. Is welfare work carried on in any of your local factories?

Becoming a Manufacturer

Would you enjoy holding some one of these various positions we have mentioned? There are a large number of them, and while manufacturing to-day is a good business, in the next fifty years it will make additional giant strides. If you like machinery, have an inventive turn of mind, enjoy building and reshaping and making things, it is likely that you would make a success in some form of manufacturing.

Training. In your high-school course study earnestly the subjects that bear on the particular phase of manufacturing that most interests you. Are you intending to be a cost accountant? Delve deeply into bookkeeping and mathematics. If you wish to become a production expert, study your physics, mathematics, bookkeeping, chemistry, and history of commerce. But high-school courses alone will not fit you for the highest success in these positions. You should also study accountancy and scientific management.

1. *By way of technological schools.* Suppose, however, you decide on manufacturing, but do not know which particular work to select. The best training for you would be a general technical education. The Massachusetts Institute of Technology is a notable institution of this sort, and your state university also may offer a first-class course. If before enrolling you know something at first hand of manufacturing, the advanced training will prove of greater value to you. But after graduation you will be surprised to be offered wages of 17 and 20 cents per hour. The maximum salary paid to a young man, no matter how well qualified, when he enters the employ of a certain great steel company, is only $50 per month. However, that is merely the opening; your real position is gained through advancement. Here the technical education proves its superiority, for although beginning at the bottom you will yet considerably distance the boy who entered the factory when you entered the technical school.

2. *In apprentice schools.* If high school and a college of technology are impossible for you, there are still ways of securing your training. Some manufacturers maintain an apprentice school, or have entered into a coöperative plan with some Y. M. C. A. or local technical school. Fifteen jewelry manufacturers of Providence, Rhode Island, have

Apprentices at school

These young men are learning how to build gasoline tractors, and their teacher is the foreman standing just in front of the big wheel at the right. (Courtesy of *Factory*)

made arrangements so that their apprentices are taught one week in the shop and the next in the public day schools, which have provided special courses for these young workers. The National Cash Register Company has been coöperating with the Dayton Y. M. C. A., and the part-time arrangement into which the University of Cincinnati has entered with certain manufacturers has become famous.

3. *After entering the factory.* If, as may possibly be the case, all such privileges are denied you, certain other means

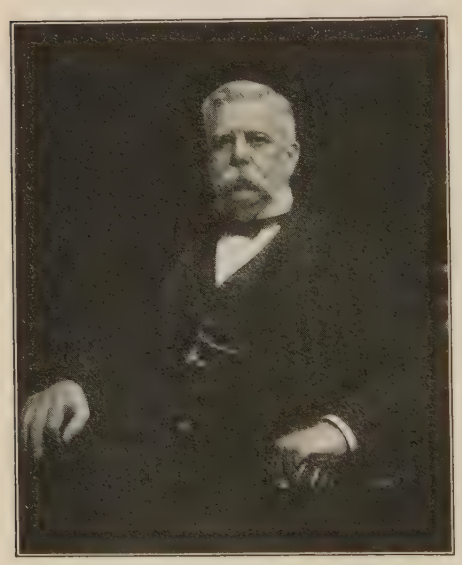
of preparation are open to every young man. You can observe and study critically factory processes. You can read some of the books listed in this chapter, and in various ways become better trained each year. The trade unions recognize the need of their men for additional training. They are not merely strike-machines, as some believe, but also great educative agencies. Unions are often alive to outside opportunities, and try in many ways to improve their members, sometimes maintaining systems of instruction for the younger workmen. Here is what one of the New York unions says of evening schools:

> Local Union 247 especially desires to impress upon our apprentice members the opportunity now afforded them for advancing themselves, enabling them to get out of the rut and to insure more favorable prospects for future success than they can possibly expect by the precarious apprenticeship system now in vogue.
>
> Our union will excuse you from attending our meetings during the school term. Grasp your opportunity now. Enroll at once and endeavor to acquire proficiency in carpentry, architectural drawing, mathematics, and other studies the school affords. Principal Henry T. Wood will accord you all encouragement possible. You will incur no expense, and your time will be spent to your personal advantage and to the credit of your associates in Local Union 247.

Advancement. "There is always a place for a man equally as large as he is mentally," the assistant superintendent of the Pope Manufacturing Company writes us. "There is no way to go across lots to success, and there is no short cut to knowledge. But there is always the long tiresome road of endeavor which so few follow consistently enough to arrive at any special destination that others have not attained." "The opportunity for advancement," a great steel company writes, "will depend upon the individual." "Every person is dependent upon himself," the National Cash Register Company tells us, "and is advanced according to his ability. The company's policy is to promote

from the ranks, and as a result of this there are employees holding responsible positions with this company who at one time were apprentices."

1. *Charles Schwab's experience.* Some statements given by Mr. Schwab explaining his rapid promotion from a grocery clerk at ten dollars a month to the presidency of the Bethlehem Steel Company may suggest ways in which you may advance in manufacturing:



George Westinghouse — inventor, engineer, and business man

Two of Mr. Westinghouse's greatest accomplishments were the invention of the air brake, now used on all railroad trains, and the alternating current electric motor. He stood for high ideals in manufacturing, and proved that such ideals can be made successful

In the first place I always stood on my own feet — always relied upon myself. There was one thing I discovered very early — that it would be well to make myself indispensable, instead of continually looking at the clock. I thought and dreamed of nothing else but the steel works. In my own house I rigged up a laboratory, and studied chemistry in the evenings, determined that there should be nothing in the manufacture of steel that I would not know. I attribute my first great success to hard and active work. I found that those who were quickest were those to be promoted. An employer picks out his assistants from the best informed, most competent, and conscientious. A man, to be successful even as a specialist, should have a good general knowledge, and, therefore, ought to read and study much, a well-informed man is always the brighter for it. All through my life I have read and studied.

2. *Andrew Carnegie's rules for business success.* And America's greatest manufacturer thus sums up for young men his rules for business success:

> Aim for the highest; never enter a bar-room; do not touch liquor. . . ; never speculate; never indorse beyond your surplus cash fund; make the firm's interest yours; break orders always to save owners; concentrate; put all your eggs in one basket, and watch that basket; expenditure always within revenue; lastly, be not impatient, for, as Emerson says, "no one can cheat you out of ultimate success but yourselves."

EXERCISES

1. Which one of the divisions of manufacturing interests you most? What reasons have you for this choice?

2. What is meant by part-time education? Is it found in your high school or college?

3. What educational work is carried on by any local trade unions?

4. How should you prepare for the particular manufacturing work which interests you most?

READINGS AND REFERENCES

Books

Carnegie, Andrew. The Empire of Business. Doubleday, Page and Company, New York, 1902. $3.00.

Cheyney, E. P. Social and Industrial History of England. The Macmillan Company, New York. $1.40.

Emerson, Harrington. Efficiency as a Basis for Operation and Wages. *The Engineering Magazine*, New York, 1912. $2.00.

Gantt, H. L. Work, Wages and Profits. *The Engineering Magazine*, New York, 1910. $2.00.

Taylor, Frederick W. Principles of Scientific Management. Harper and Brothers, New York, 1911. $1.50.

Taylor, Frederick W. Shop Management. Harper and Brothers, New York, 1911. $1.50.

Tolman, W. H. Social Engineering. McGraw-Hill Book Company, New York, 1909. $2.00.

Wildman, John R. Cost Accounting. The Business Book Bureau, New York, 1913. $2.00.

Williams, Archibald. How it is Made. Thomas Nelson and Sons, New York. $1.20.
Manufacturers. Abstract from the thirteenth census, 1910, pp. 433–536.

Pamphlets

Opportunities with the Western Electric Company. Distributed free on application to the Western Electric Company, Chicago. (This is a sample of pamphlets sent out by several companies giving information to prospective employees.)

Articles

Coulson, R. E. "Are $300,000,000 worth Saving?" *System*, Vol. XXIII, April, 1913, p. 363.
Dawley, T. R. "Our Southern Mountaineers." *World's Work*, Vol. XIX, March, 1910, p. 12704.
Orth, S. P. "Battle Line of Labor." *World's Work*, Vol. XXV, November, 1912, p. 49.

Periodicals

Factory. A. W. Shaw Company, Chicago. $2.00 per year with premium book.
The Engineering Magazine. New York City. $3.00 per year.

CHAPTER IX

THE BUILDING TRADES

In the elder days of Art,
Builders wrought with greatest care
Each minute and unseen part;
For the Gods see everywhere. — LONGFELLOW

Men have never before lived in buildings so comfortable and convenient as those to-day, and in consequence there has never been a time when a skillful builder was more necessary and his services more appreciated. In our country we find a million carpenters and joiners, a quarter million masons, over one hundred thousand plumbers, a third of a million painters and decorators, and, we might add, to complete this list of builders, thirty thousand or more architects and their assistant draftsmen. Who can estimate the immense service to our daily comfort of this army of peaceful tradesmen? To them we say, in Ruskin's words, with ever-increasing confidence that they will not disappoint us, "I would have, then, our ordinary dwelling-houses built to last, and built to be lovely; as rich and full of pleasantness as may be within and without."

GENERAL SCHEME OF WORK OF THE BUILDING TRADESMEN

The carpenter constructs the wooden framework above the foundations and builds the wooden part of the outer and partition walls, the roof, floors, doors, windows, and other woodwork.

The mason lays stone, brick, or concrete foundations, builds chimneys and the major part of brick, stone, and concrete buildings, blankets the iron structural framework of city skyscrapers with stone, cement, and brick, and does inside plastering and outside stucco work.

The structural ironworker builds the iron framework of large public buildings, factories, and skyscrapers.

The plumber, steam and gas fitter, and sheet-metal worker attend to installing the heating, gas lighting, and sanitary systems as well as to the roof and cornice work. Sometimes there are three tradesmen who separately look after these different parts of the work; sometimes there is but one contracting plumber.

The practical electrician wires the house, block, or factory for electricity and installs electric lighting and, if desired, power and heating.

The painter and decorator paints the outside wooden (and sometimes brick) surfaces of buildings, "fills" and "finishes" the interior woodwork, and papers or otherwise decorates the inside walls and ceilings.

The building contractor holds the contract for the entire building operation and is usually a master carpenter or mason. He is over the subcontractors, who are in charge respectively of the carpentry work, the masonry, the plumbing and heating, or the electrical installation. On the smaller jobs, where no architect is employed, the building contractor may also draw up the plans and specifications.

The architect (usually a professional engineer and not a tradesman) draws up the plans and specifications of all large building operations, oversees regularly the construction as it proceeds, and is the deciding authority on matters of difference between the contractor and the owner. This workman will be treated at length in Chapter XI, The Engineering Professions.

The janitor (not a building tradesman but every day an increasingly important workman connected with buildings) tends the heating, ventilation, and sanitary equipment, looks after the upkeep and minor repairs, and keeps the building clean and wholesome for its occupants.

THE CARPENTER

Of all the building tradesmen, the carpenter would surely come first to the mind of the average boy. At any rate, most boys are builders of something — whether windmills, waterwheels, wagons, sleds, boats, or other contrivances. So when educators decided on manual training as an excellent subject for interesting boys and for developing the dexterity of their hands, they very naturally introduced woodworking into the schools. We trust that you all have

been so fortunate as to have taken such a course in your grammar-school days. Now let us get better acquainted with this interesting and very necessary tradesman, the carpenter.

Rank of carpentry as a trade. Not only is carpentry pleasant because of its woodworking, but as a whole it is a high-grade occupation, healthful, stimulating, ennobling. According to a scale of measurement devised by Dean Herman Schneider of the School of Engineering, University of Cincinnati, carpentry would rank very close to the 100 per cent point. He rates the work of the locomotive engineer at 100 per cent because of its beneficial character and conditions. Let us take his analysis of the engineer's vocation and compare it part by part with that of the carpenter and note their similarity and the reasons for their high rating:

1. "The work of the locomotive engineer is done in the open air." So is much of the carpenter's work.

2. "It provides a fairly well-rounded physical development." This is just as true of the carpenter's activities.

3. "The constant improvements in locomotive design and railway appliances generally require continuous mental development." The improvements in building design, materials, and appliances would have the same effect.

4. "Mental alertness is constantly required for emergencies." The carpenter, too, must keep his wits about him.

5. "A comprehensive grasp of the whole interdependent scheme of production (a railroad produces transportation) is essential." The carpenter should have a comprehensive grasp of the whole interdependent scheme of the house that is building, his work and that of the mason, the plumber, the electric wirer, and of the painter and decorator, as well as a grasp of the owner's wishes and personal traits.

6. "The conditions under which the same run is made are never alike." Could the conditions under which any two houses are built be exactly alike?

7. " *The work itself* breeds in the engineer the highest quality of good citizenship; namely, an instant willingness to sacrifice himself for the lives in the train behind him." To build houses conscientiously breeds in the carpenter good citizenship; namely, a constant willingness to sacrifice his profits and to lose money, if necessary, for the sake of doing a thoroughly good job in "each minute and unseen part." Carpenters are not called upon as locomotive engineers may be, to give up their lives, but they are expected to build honestly, even though part of their work is covered by plaster and will never be seen.

Nature and remuneration. As we have just seen, carpentry is mostly open-air work; it provides a fairly well-rounded physical development; it requires continuous mental development; it furnishes variety and interest; it breeds moral qualities. Unlike some tradesmen, the carpenter requires but little capital except credit and skill to advance from workman to proprietor, or contractor. He will take first a small job as carpenter and contractor, and then, by making a reputation as a reliable, skilled tradesman, he may advance naturally to larger and larger jobs until he becomes a prosperous contractor. To one of artistic tastes who will take the proper courses of study, carpentry can also be made the stepping stone to architecture, a well-paid profession. As for social standing, the carpenter and his family are privileged to move in the best circles, provided their personal worth, accomplishments, and financial standing warrant it.

We find its most serious disadvantages to be lack of work for part of the winter and during business depressions, and competition with less skilled carpenters who either crowd the trade or lower the wages. However, as in most occupations, the more reliable and skilled workmen do not lose much time and are usually paid the highest wages.

At this point it will be well to explain a few technical terms. To-day a young man may get his preparation for carpentry as well as for masonry, plumbing, and various other trades by taking a course in a special school where these are taught, or by contracting for a term of years, usually three, with a man already skilled in the particular occupation to serve as his helper and thus to learn the trade. In this scheme, called the apprentice system, the skilled workman is termed a journeyman and the youth learning the trade an apprentice. In the trade school the learner earns no wages and often has to pay a small tuition fee, while the apprentice is usually paid some wages from the start. Because of the present insufficient number of these schools, and the fact that many young men cannot afford while learning their trade to give up two or three years with no wages, there are still many youths serving as apprentices.

Now let us glance at the earnings of some of these learners both from the trade school and from the ranks of the apprentice. Within six months after graduation from a three years' course in carpentry at the Williamson Free School of Mechanical Trades, near Philadelphia, the class of 1910 were earning on the average $19.59 a week. This is a fair sample of the wages received by trade-school graduates in one section, at least, after a course of from two to four years, during which time they are earning no money. Apprentices from 16 to 19 years of age often earn from $1 to $1.25 a day the first year, from $1.15 to $1.75 the second year, and from $1.50 to $2.25 the third year, the wages depending very much upon the section of the country and the teachableness and industry of the workman. The journeyman receives commonly from $3 to $5 and, in some cities, even $5.50 a day. Generally speaking, the demand for regular employment of skilled, reliable carpenters is good, the most capable losing little time. The less competent might average from 225 to 275 days of work per year.

In carpentry the opportunity for advancement is comparatively rapid for young men of the right sort. There is also gain here in following the father's trade, although, should his father be an employer, the son must be careful not to put on airs among the men. If the apprentice makes himself popular with the foreman by willingness to do cheerfully and carefully all that is asked of him, he will be taught many things about working from specifications, and other fine points. At noon he can get the plans and study them and help himself to master their use. In some cities he can study architectural drawing at night school, and, wherever he may be, he can advance in value to his contractor by studying courses from correspondence schools. In many ways it is possible for the young carpenter of the right mettle to advance rapidly in his trade and make a good living.

Natural qualifications and preparation. Of course, if you are going to be a successful carpenter, you must have a liking for woodwork, for mathematics (especially geometry), and for things mechanical. Quite likely also you know woodworking tools and have made many contrivances and repairs about the house. If this is the case, you doubtless have a natural bent toward carpentry.

If you should choose this trade, what would be the best preparation for it? First of all, you should complete a high-school course, paying most attention to business arithmetic, geometry, physics, free-hand and architectural drawing. Next attend one of the best trade schools, where they are more and more taking real contracts for their boys to work out under practically the same conditions as regular apprentices meet, except that in the case of the trade school the "bosses" are all expert teachers. Therefore, if you have wise teachers and real houses to build, the trade school should graduate you as the best-trained carpenter. Many large cities have these schools, in which the courses are from two to four years, and the tuition is either free or very inexpensive.

If you are a high-school graduate eager to add to your education nights and at odd moments, and if at the same time you can find an expert contractor who will take a real interest in you, then the apprenticeship system has one real advantage — you will receive wages during the three or four years you are learning the trade. In whatever way you may get your preparation, it would be well for you, in order to get into the atmosphere of your proposed life work, to talk to carpenters about their trade and their life, to read books on woodwork and carpentry, and, if possible, to borrow at least one carpenter's magazine from a carpenter friend, and later to subscribe for it.

Facts concerning this trade by a prominent carpenter. We print here in part a letter from Mr. Frank Duffy, General Secretary of the United Brotherhood of Carpenters and Joiners of America, who gives us the following expert information concerning his trade:

One of the greatest advantages of the carpenter's trade is that it is an "out-of-door" occupation, and, if engaged in under proper conditions, is most healthful. It is interesting in many ways, particularly in that there are many opportunities to become a skilled mechanic in the work. There is much in this vocation that tends to the development of the mental and moral faculties.

The salary, or wages, of the carpenter varies in different localities, and the remuneration of the apprentice and first-year man varies likewise. In the city of Chicago, which may be taken as an average case, the wage for the first-year apprentice is $6 per week, for the second year $7, for the third year $8.50, and for the fourth year $11. In Boston, Mass., the apprentice receives $7 per week for the first year, $8 per week for the second year, and for the third year not less than $10 per week. In Hartford, Conn., journeymen carpenters receive $4 per day for eight hours' work.

It may be safely said that we have more old men in the ranks of our organization than any other craft. Being an out-of-door occupation, it is naturally healthful, and it is not putting it too strongly to say that the average active career is from twenty-five to forty years, or even greater.

Compared with other trades, the opportunity for advancement is rapid, three years as a rule being all that is required to learn the trade

and become a competent, skilled workman. There are many carpenters who, in the course of time, become contractors doing business for themselves. We venture to say this happens more often in the carpenter trade than in any other manual occupation.

A common-school education is absolutely necessary, that is, up to and including the eighth grade. Of course a high-school education, properly made use of, is of great assistance, particularly in its mathematical department.

Fine carpentering or cabinetmaking. 1. *Nature of the work.* Until within a half century the carpenter not only built the wooden part of houses but also made all wooden utensils, furniture, and even coffins. Gradually these articles came to be made largely by machinery in factories, so that most of this work has been taken away from our tradesmen. However, there still remains to the finer workman of the craft a portion of this inheritance, the making of elaborate furnishings and massive furniture for palatial residences and of specially designed furnishings of wood for large offices, stores, and public buildings, and the repairing of choice handmade furniture.

In every large village or city, and connected with every important firm manufacturing pianos or a high grade of house furniture or of wood furnishings for office or store, you will find one or more fine carpenters who are skilled cabinetmakers. While their work is with wood, it is very different in many ways from the work of the ordinary carpenter. The one is employed on fine work indoors, the other spends much of his time on coarser work outdoors. The one is a building tradesman engaged in constructing houses, the other is a maker and repairer of fine furniture for the interior of such structures.

Cabinetmaking is allied to one phase of the arts and crafts work, furniture making, and perhaps somewhat less closely to pattern making (which is treated in Chapter X), since both have to do with woodworking. Cabinetmaking or fine carpentering is of interest to boys who enjoy doing

exact work, who love beautiful furniture, and who are fascinated with creating artistic forms from the best grades of wood.

2. *Remuneration.* While the natural qualifications and special training of the carpenter and the cabinetmaker differ considerably, their remuneration is about the same, except that some few expert cabinetmakers who are of high artistic ability receive much higher wages. Again, the employment of the cabinetmaker may be more regular, since it is indoor work, and thus his yearly income would be greater. Then, too, there are some building carpenters who are also expert in fine workmanship; these do odd jobs in cabinetmaking and thus fill in their spare time and add considerably to their income.

EXERCISES

1. Find out from the carpenters in your neighborhood whether any of them are willing to train apprentices. If so, what sort of boys do they want, and how long will the term of apprenticeship be?

2. If a trade school is within easy distance of your school, send some member of your class there to investigate what trades are taught, and get the trade school's reasons for considering its graduates better trained than the apprentices. If the trade school is too far away for a visit, have some member of the class get full information on these points by writing the principal.

3. What wages are paid the carpenters of your acquaintance? How many days a year on the average do they work?

4. Find out from some successful contractor how he advanced from carpenter to contractor. How much extra work did it require? How much additional study? What capital?

5. Inquire of some prosperous architect whether he used carpentry as a stepping stone to his present profession and whether any of his fellow architects advanced from this trade.

6. Does the increasing use of concrete and structural iron in building benefit or injure the carpenter's trade? Ask your carpenter and contractor friends about this.

7. Find out all you can about cabinetmaking as plied in your community.

THE MASON

If of the building tradesmen you naturally think first of the carpenter, you will without doubt think next of the brick and stone mason. As many of you know, this tradesman commonly builds chimneys, walls, foundations, abutments, etc. by laying, according to specified plans, bricks, stones, or cement blocks tier upon tier with mortar between. He also constructs entire buildings and bridges of concrete, blankets the iron structural framework of sky-scrapers with stone, cement, or brick, and does inside plastering and outside stucco work.

In the country carpentry is of more importance than masonry because the woodwork in country buildings is the most essential feature of the construction. In the large structural work of the cities, however, it is the mason who has the main part to perform, and often he becomes the general contractor for the whole building operation. The ideal of good masonry is a structure that shall stand as the backbone of the building, firm and enduring, its comparatively large cost at first insuring no further care or expense.

Rank as a trade. Let us see how this trade, which numbers approximately a quarter of a million workers in our country, ranks as an occupation when compared with Professor Schneider's scale of measurement.

1. It is largely an open-air occupation.
2. It provides a fairly well-rounded physical development.
3. The constant improvements in building design, materials, and appliances require continuous mental development.
4. Mental alertness is constantly required for emergencies.
5. The mason should have a comprehensive grasp of the whole interdependent scheme of the structure that is building, of his work and that of the iron structural worker, the carpenter, the plumber, and the electric wirer, as well

as a ready comprehension of the owner's wishes and personal traits.

6. The conditions under which the mason works on any two jobs are never alike.

7. The work of the mason, if honestly wrought in each minute and unseen part, is conducive to good citizenship. He renders the community a most essential service in his building operations. If, in order to do an honest job and live up to his agreements, he is equally willing to make a profit or to lose money, then truly his work breeds in him a high quality of citizenship. Like that of the carpenter, the mason's trade ranks high in these essentials of a vocation.

Advantages, preparation, and remuneration in comparison with those of carpentry. It requires at the start but little capital to advance from journeyman mason to small contractor. While his employment is somewhat less regular than that of the carpenter, his wages are enough higher to make up for this. His opportunities for advancement and his social standing are about the same as those of the carpenter.

Young men planning to enter either of the two trades should have about the same natural qualifications — a liking for tools, science, mathematics, and drawing — and the same thorough high-school education. To be successful in either trade they must be businesslike, industrious, ambitious, not loafing at odd moments, but constantly, steadily forging ahead.

The wages per day for the mason are a little higher, but for the year they are about the same as those of the carpenter. From a letter received from Mr. William Dobson, Secretary of the Bricklayers, Masons, and Plasterers' International Union of America, we learn that the wage scale of bricklayers in Philadelphia is $5 per day and that of stonemasons $4. The wages in the Middle West vary from $3.60 to $6 a day, and in the far West, at San Francisco, the wage scale is $7. These wages, of course, are for

journeymen. The apprentices receive about the same as in the carpenter's trade, starting at $1 per day.

Actual work of the apprentice. The apprentice is taught to make the various kinds of mortar by mixing lime or cement with sand or gravel and adding water. In order to make good mortar he is trained to use the right amount of each ingredient and to mix them together properly. He carries this mortar as needed to the journeyman mason whom he serves as helper, supplies him bricks, stone or tools, and helps him in every way possible, while he observes closely how every part of the work is done.

It may be months, however, before the apprentice is trusted to lay any bricks or stone in an actual structure, although much depends, of course, upon how quick the young man is to learn and how careful he is, and upon the willingness of the journeyman to have his helper advance in learning the trade. Step by step the apprentice advances from mortar mixer and general helper to brick and stone layer, at first on very simple pieces of construction, up through more and more difficult and responsible parts of the work, until after three years, as a rule, he becomes competent to build any ordinary structure of masonry and is thenceforth known as a journeyman or master mason.

Perhaps it cannot be stated too often or too vigorously that practical tradesmen do not want in their employ young men who are at all superficial in their general education or in the special training received for their trade. These sensible men do not care what you know but what you can do, and what you will do when given an actual job.

The contracting mason. The tradesman who receives wages is, of course, working for another man, but if he is ambitious and self-reliant he will, in all probability, after a few years become his own boss and himself hire workmen. Since contracting is a business enterprise, whether carried on by carpenter, mason, or other tradesman, it is impossible

to state what income one could expect. He might make a few hundred dollars one year and lose it all the next, or he might steadily add to his capital, clearing a few hundred dollars from nearly every job until he had acquired a fair-sized capital. As it is, throughout our country there are many prosperous contracting masons who have accumulated considerable property. To the right man, first as journeyman and later as contractor, the mason's trade offers many advantages and ranks as a desirable vocation.

EXERCISES

1. Find out from the contracting masons in your neighborhood whether any of them would care to take and train an apprentice. If so, what sort of boy do they want, how long will they expect him to serve as apprentice, and what wages will they pay him each year?

2. If a trade school where masonry is taught is near you, send for a catalogue and note the preparation required of those entering, and examine closely the course of study and the plan of instruction as outlined.

3. If no such school is near, write to the Williamson Free School of Mechanical Trades, Williamson School Post Office, Pa., for a catalogue and their free bulletin on bricklaying, or for the free bulletin of the School of Applied Industries, Carnegie Institute, Pittsburgh, Pa.

4. Find out from some successful contractor how he achieved his present prosperity. Did it require much outside study or extra work? How much capital?

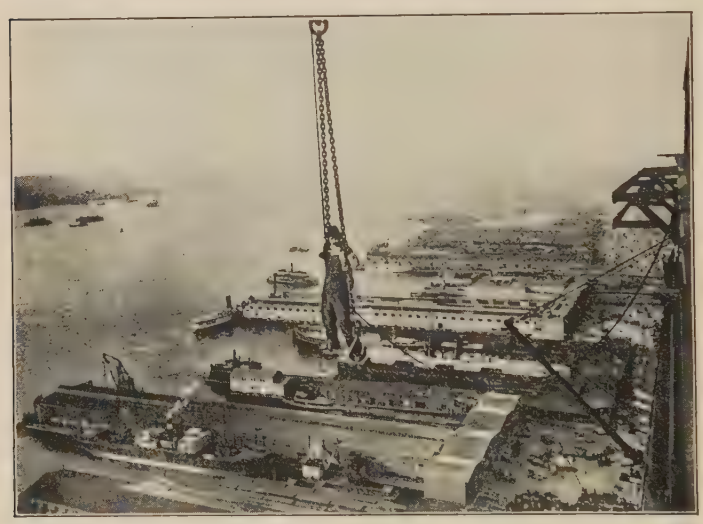
5. Find out from the contracting masons of your acquaintance whether the increasing use of concrete and structural iron in building benefits or injures the mason's trade.

6. In your community are there more carpenters or more masons? Can you tell why?

THE STRUCTURAL IRONWORKER

Increasing demand for skyscrapers. As land soars in price, the buildings upon the land must also soar in height. While this rule is practically universal, its results are most interesting on or near the island of Manhattan, New York.

In 1909 we find completed the highest structure of steel and masonry hitherto attempted, the Metropolitan Life Insurance Building on Madison Avenue and 24th Street, New York City, extending 50 stories above the sidewalk. Since then the Woolworth Building on Broadway and Barclay Street, the highest building in the world, has been



At work on a skyscraper

The ironworker can see far below him people on the street and at his right the Hudson River and ocean liners at dock. Only men of steady nerve can work at such dizzy heights

erected, towering 55 stories above the street, or 750 feet in all. Some authorities declare that there is no good reason to suppose we have nearly reached the limit of perpendicular construction, and that we may expect much higher skyscrapers in the future.

Carpentry and masonry alone, however, would never make possible such colossal buildings. The building's real support is an inner framework made of steel bars and

plates riveted solidly together by the structural ironworker. While you may never care to enter the ranks of these so-called "cowboys of the skies," still they are so necessary to the building of huge city blocks, which are becoming increasingly common, that we must look somewhat into their life work.

The work of the structural iron builder. His task is to raise by means of engines the steel trusses, girders, and beams, some weighing even 20 tons apiece, put them into place, and rivet them fast as parts of the whole skeleton of the building.

Besides the frightful perils of this work, or perhaps to add to them, the men are urged on with their building operations under tremendous pressure. Think of a massive granite and brick fireproofed skyscraper covering two thirds of a block being urged upward at the rate of a story a week! But such has been done. The men work in day and night shifts so that no time shall be lost; for do you realize how great would be the daily or weekly interest on the millions of dollars tied up in such an enterprise? It is estimated that the Woolworth Building complete cost $15,000,000. At 5 per cent the annual interest on this sum would be $750,000. What would be the loss for every day wasted in completing this structure? Naturally, the contractor and foremen urge on the men to the limit of their speed, which means working under a severe nervous tension except at times when, for the sport of it, they vie with each other or workmen on neighboring skyscrapers in little trials of speed. To appreciate the terrible stress and strain under which these men labor, read "Skyscrapers While You Wait," by William Allen Johnston in *Harper's Weekly* of June 11, 1910.

Preparation and remuneration. The qualifications for a successful ironworker are for the most part natural and inherent. He must be sober, cool, level-headed, quick of

sense and action, daring, but still cautious. As for education, he must understand working from blue prints and know something about the mechanics of building. The graduates of manual-training high schools advance most rapidly to the positions of greatest responsibility and pay. The new recruits, for the most part, come from the ranks of bridge builders, sailors, and circus men, and, after some experience, these "housesmiths" receive from $24 to $30 a week. The foremen get from $35 to $55 a week, but their employment as well as that of their men is somewhat irregular.

Probably very few, if any, of you will choose structural ironworking for your vocation; but since the services of these men are so necessary in our cities, we should at least know something about their lives, and we should do our part, whether from within their ranks or from the outside, to have their calling made as free from danger as possible. These men, like railroad employees and others engaged in any hazardous occupation, should be urged (and, if necessary, encouraged by reward) to practice "safety first," and then their employers should be forced by public sentiment and penal statute to safeguard in every way possible their building activities.

EXERCISES

1. What features of the ironworker's life should you like? Which should you dislike?

2. From your personal investigations, which trade should you prefer, that of carpenter, mason, or structural iron builder? Explain your reasons.

THE PLUMBER

Recent growth of this trade. While in 1840 the trade of plumbing was practically unknown, to-day there are in America over 100,000 plumbers. In 1860 there were 170 factories manufacturing plumbers' supplies; in 1900 there

were 12,050 such establishments. In 1860 the product of the 170 plumbers' supply factories was valued at less than $2,000,000; in 1900 the product of the 12,050 factories was worth nearly $147,000,000, more than seventy times as much as forty years previous.

The reason for this great increase in the plumbing business is seen when we consider that in no branch of mechanical science has there been more noteworthy progress than in plumbing, heating, and ventilation, the province of the plumber. Heating and ventilation, once regarded as incidental features of building construction, are nowadays considered matters of extreme importance. Likewise, an intelligent public now appreciates the disastrous results from defective plumbing, and in order that all sanitary work shall be performed according to scientific principles, municipal regulations and ordinances have been quite generally enacted to safeguard the public health by condemning all plumbing and drainage systems improperly installed. This new order of things has made a technical education necessary for the man that hopes to hold a position of any prominence in the broad, intricate field of plumbing. And as a result, plumbing is assuming an ever higher rank as a trade fit for a brainy, technically trained man.

Nature and remuneration. In his book "What shall Our Boys do for a Living," Mr. Charles F. Wingate writes:

> I would strongly advise young men to become plumbers. A first-class plumber must understand both the theory and practice of sanitary science. He ranks with a machinist or an engineer. Within a very few years the trade has been revolutionized and there is a growing demand in all parts of the country for capable plumbers. A young man who is master of the trade has a great advantage over the ordinary, ignorant, unscrupulous plumber, and should have no difficulty in getting plenty to do.
>
> Not only is there a steady demand for new buildings in all parts of the country, but repairs and alterations are also going on continually, and the plumbers who can give satisfaction to customers easily succeed.

One of them told me he had not lost a week's work in thirty years. He said there were four men in his shop who received fifty cents a day extra because they could follow plans and specifications correctly, could measure and order exactly what materials were needed, were able to explain clearly to customers just why certain things should be done, and could act with discretion in emergencies. Such practical sagacity and "gumption" count for much. The timid and indifferent workman who blindly follows orders when he knows they are wrong or need to be modified is the first to be laid off when work is slack.

Plumbing is on the whole healthful and mentally stimulating, and offers a good livelihood to sober, industrious men of a mechanical turn. Because of the great variety of conditions and often perplexing difficulties under which systems of plumbing, ventilation, and heating must be installed, the plumber requires much mechanical resourcefulness, at times amounting almost to inventive genius. To the right sort of plumber there is steady employment, pay equally as good as that of the carpenter or mason, and the opportunity of at least steady, if not rapid, advancement. Many capable plumbers have advanced to contractors and dealers in plumbers' supplies, while a few have worked their way up to the position of sanitary engineer.

Perhaps the most serious disadvantages of the trade are living down its bad repute in some localities because of former unscrupulous plumbers, and the occasional dirty work to be done in cellars, sanitaries, and sewers. Still, there is disagreeable work to be done in all occupations; and the plumber of to-day and to-morrow will receive increasingly greater respect as he elevates his trade by giving to it more brain and better service. Since the province of the plumber has so much to do with our comfort and health, he has it in his power to render the community a vitally important service.

Apprentices sixteen years of age or older receive as helpers the first year from $5 to $6 a week of forty-four to forty-eight hours, the second year from $6 to $8, and the

third year $7 to $10. Journeymen receive from $3 to $6 a day, depending upon the man and the prevailing wages in his locality.

Natural qualifications and preparation. If you aspire to become a master plumber, you should be of a mechanical, almost inventive turn, and not adverse to soiled hands, face, and clothing, or dirty work that may interest or absorb you. You must not shrink from dimly lighted, ill-smelling damp places if your work of properly installing a system of heating or of sanitation leads you there. As with the prospective carpenter or mason, you should have a liking for geometry, science, and drawing, and, if possible, should complete a high-school education before beginning to learn the plumber's trade. Here also you should emphasize the mathematics, science (especially physics and physiology), mechanical drawing, and English composition. If you talk with successful plumbers about your education, they will tell you how easily you can waste your time in school by skimming the top of many polite subjects instead of going to the bottom of a few related practical subjects and regularly applying the facts learned to everyday things. They will also strongly advise you to invest your spare time after school and during vacations in some business-like pursuit, preferably connected with some mechanical or building activity.

It is well to try out your supposed liking for plumbing or any other occupation by doing, if possible, some work at odd times in the trade itself. There are to-day many good trade schools where plumbing is taught on real contract jobs in two-year and three-year courses. Enroll in the one most convenient, and consider yourself a real employee, ever alert to serve your employer to best advantage; and after completing the course in earnest fashion, you will soon be receiving a journeyman's wages and be well on the way to becoming a prosperous contractor or a successful sanitary engineer.

EXERCISES

1. If a trade school where plumbing is taught is near you, send some member of the class who is interested in this trade to investigate the course and the kind of instruction, the sort of boys and instructors, and report fully to the class.

2. Let some member of the class write for a free catalogue to the State Trade School at Bridgeport, Conn., or at New Britain, Conn., or for the free bulletin of the School of Applied Industries, Carnegie Institute, Pittsburgh, Pa., or for the free announcement of courses in plumbing, heating, and ventilation of the International Correspondence Schools, Scranton, Pa.

3. Find out from some successful contracting plumber what general education and what special preparation he considers best for a boy who intends to become a plumber. What sort of boys would he think best adapted to learn his trade?

4. What wages are paid the journeymen plumbers of your acquaintance? How many days' work a year do they average?

5. Which of the building trades in your community seems to be the most prosperous? Can you explain the reason?

THE PRACTICAL ELECTRICIAN

In this day of electric lights in practically all modern buildings and of electric power in many blocks and factories, there is a great demand for well-trained electricians. There are many kinds of electrical workers, but here we shall treat only the one that is closely allied to the building tradesmen, the one who wires our buildings and installs the lights and, if desired, electric motors and heating equipment. Because of the great danger of fire from defective wiring of buildings, there is a code of strict rules made out by the National Fire Protection Association which in many states the electrician must observe.

The prospective electrician requires a thorough technical training as well as much practical experience gained under skilled instructors in installing and wiring for bells, annunciators, arc and incandescent lights, motors, etc. before he

can start as an independent journeyman. For many of us the service of this tradesman is as necessary to our comfort evenings as the light of the sun is in the daytime. Because of the conveniences in our homes provided by the practical electrician, he easily deserves in our estimation a place by the side of the plumber.

Natural qualifications and preparation. If you think of becoming a practical electrician, one who understands thoroughly the work of wiring and installing electric lighting and power, you should first of all have an absorbing interest in electrical devices of all kinds. This includes, of course, a mechanical bent and some mechanical ability.

In your high-school course you would naturally specialize in mathematics, mechanical and architectural drawing, and in physics, especially magnetism and electricity. While attending high school and after graduation it would be well if you could serve for a time as helper to a local electrician in order to get in touch with the practical side. Next, a two-year or three-year course in a good trade school would fit you as a journeyman. To the studious, persevering young man the trade of practical electrician may serve as a stepping stone to the profession of electrical engineer, one of the most attractive in the engineering field.

Remuneration. Throughout the United States helpers and apprentices are paid from $1 to $3 a day, and as high as $4 in certain cities. Journeymen receive from $2.50 to $6 a day, the highest wages being paid in Illinois, New York, and Massachusetts. Quite often the successful electrician conducts an electrical hardware store in connection with his contracting business, and thus adds to his income. Of all the trades connected with building operations, that of practical electrician is to-day one of the most attractive. It might be added that this branch of electrical work is as healthful as any of the other building trades and as free from accidents.

EXERCISES

1. In your locality investigate and compare the trade of practical electrician with those of carpenter, mason, and plumber. Which of the four should you prefer? Why?

2. In what ways would you consider the work of the electrician who wires houses, blocks, and factories for light and possibly power more desirable than that of the linemen electricians?

3. Do you know any practical electrician who has become a successful electrical contractor and dealer in electrical supplies or who has become a successful electrical engineer? In either case, inquire how he prepared himself as journeyman, and how he advanced to his present position.

THE PAINTER AND DECORATOR

The architect may plan a new house; the building contractor and his assistants may build and equip it with modern conveniences; but for every house that in any given year is so erected and equipped, there are thousands that are redecorated both inside and out. In large measure the architect and builders make the building, but the decorators make the home. How large a part of our comfort and happiness depends upon the æsthetic satisfaction received through the sense of sight! Is it not a reflection upon our people that of the trades centered about the construction and finishing of our homes, the painting and decorating trade, numbering in America a third of a million men, is the poorest paid, the most hazardous on account of disease, and requires the least preparatory education?

Training. In painting and decorating a home or other building, how essential that the master decorator should be well educated, cultured, and well grounded in the technique of his art! So, while the ordinary painter and paper hanger has been getting along without even a high-school education or the special preparation for his trade gained from a trade school or from a full term as apprentice, it seemed a most

auspicious step forward when Columbia University recently dignified the study of interior decoration as a profession by according it a place in the curriculum by the side of architecture, engineering, law, and medicine.

Columbia has done more. Recognizing the fact that many prospective or actual decorators could not afford the time or money for a college course in the science and art of decoration, this great university is offering special courses for tradesmen, shorter and more elementary, both for day and evening classes. We shall all welcome the day when more universities will follow the example of Columbia, and when every city and large community will have its experts in house painting and decoration, specially qualified as master tradesmen by a thorough preparation received in a university art school or in a good trade school.

General conditions of the trade. To come nearer to present conditions of the trade, however, let us read in part what Mr. J. C. Skemp, Secretary of the Brotherhood of Painters, Decorators, and Paper Hangers of America, recently wrote in answer to questions concerning his trade.

The most serious disadvantage of this trade is lack of steady employment, as many painters and paper hangers lose considerable time through the winter months during the dull season.

The wages of apprentices are usually about $3 per week when they begin learning the trade. The salary of competent mechanics averages $4 per working day of eight hours.

The demand for regular employment is better in large than in small cities and painters as a rule average about nine or ten months steady work during the year. The average active career of this vocation is about twenty-five years. The opportunity for advancement is rapid.

No special qualifications are required except for decorator. Decorators should have a natural aptitude for drawing, and many have become experts through lessons obtained by correspondence courses. No great amount of general education is required, although a general knowledge of minerals and painting materials is beneficial. In some cities, especially in Chicago, schools have been established by this brotherhood for teaching apprentice boys the trade of decorating and paper hanging.

Disadvantages. To suggest some of the diseases incident to painting, a quotation from the July, 1913, number of *The Painter and Decorator* will perhaps best serve our purpose:

Men engaged in the painting trade come into contact with materials some of which are well known to be of a dangerous character unless used with intelligence. It has been shown that various vehicles such as turpentine, china-wood oil and other more volatile substances give off emanations which may produce ill effects unless there is adequate ventilation. Therefore the latter should be insisted upon.

The use of lead in painting is so universal and of such ancient date that painters usually know of its dangers and how to minimize them. It has long been realized that personal cleanliness is absolutely necessary and that this eliminates much of the danger. There is a phase of the painter's work, however, that involves danger even to the man of perfectly cleanly habits. This is the process of sandpapering down paint work. Here the fine dust may get into a man's lungs and stomach and do great damage to his health.

Dr. Alice Hamilton, an agent of the United States Government, has suggested a common-sense method of lessening this, the greatest danger to painters from the use of white lead. She has found that the use of a volatile oil for moistening the sandpaper will prevent largely the dust flying. This oil is said to evaporate and leave the surface in perfect condition to receive the paint.

A brighter outlook. We are glad to see that the dangers of disease from painting and decorating are being investigated and as fast as possible prevented, for nearly all of them are preventable. It is a most hopeful sign that courses of instruction in this trade, which has the power of making our homes beautiful and delightful, are being established; and doubtless before long there will be many excellent courses of this sort throughout the country. Then the public must appreciate more fully the valuable service rendered by the decorator, and, after providing adequately for his health and demanding an increasingly higher grade of work, it should pay him more liberally, or more fairly, for his services. We hope that with these improvements and advantages the trade of painter and decorator will soon take its rightful place near the head of the building and allied trades.

EXERCISES

1. Do the painters and decorators in your town or city conduct, in connection with their trade, stores equipped with supplies for painters, paper hangers, etc.?

2. Do the painters and decorators in your locality lose more days a year than the other building tradesmen?

3. How do painters and decorators compare in health with these other tradesmen?

4. Why do painters and paper hangers receive lower wages than the other tradesmen so far studied?

5. Do you think this trade will ever rank as high as that of carpenter or mason? Give your reasons.

6. Do you consider the artistic decorating of a home or public building of much worth? Explain why.

THE BUILDING CONTRACTOR

To be at the head of a large factory, a retail store, a railroad, or an institution; to be at the head of anything worth while; to be able to do things and to direct others to execute plans — this rightly appeals to young America. In the building activities there is for every big job such a head, who directs the work of construction and has charge of all its details.

Nature of the work. When he has received from the owner the contract to construct a certain building, after a definite plan, to cost a set amount of money, then the building contractor, as executive in charge of the job, has the excavation dug, the foundations laid, the superstructure reared, the building roofed and inclosed, and the interior finished and equipped. In very truth, he is the real builder; and as the building grows from day to day until it becomes perfect in its every detail and he turns it over to the owner, he must feel much satisfaction in creating from materials, with the help of his men, a magnificent house or a substantial block.

Such a building contractor is a business man rather than a tradesman, although he must understand his own trade well and all the other trades coöperating on the work. A successful contractor, it is seen, is much more than a journeyman carpenter or mason; he has to be proficient in all

The building contractor begins work

The foundations here shown rest upon solid rock, extending to an average depth of 85 feet below the street curb. Upon this was erected the structural steel framework shown in the frontispiece, 35,000 tons of metal held together by over a million rivets and extending above the street for 40 stories. To this structure were then added 10,000,000 bricks, 85,000 barrels of cement, 5000 windows, and 48 elevators. It is now considered the finest office building in the world, able to house in comfort over 15,000 persons

the building trades, accurate in computing the cost of the materials and labor required, skillful in buying the materials and in selecting his workmen, and forceful and tactful in pushing forward the work so as to avoid unnecessary delays, which mean loss of money.

Advancement and remuneration. Some excellent journeymen carpenters and masons do not have the education or the business ability to be building contractors. But since at the top of the ladder is the successful building contractor, is it not worth the while of every prospective carpenter or mason to see to it that he secure sufficient education, that he be not satisfied with a mastery of his own trade merely but that he extend his knowledge to cover the other trades involved in construction work, the cost of building materials, how to buy most advantageously, how to get on well with men, and how best to secure rapid construction work?

Such is the situation. As for the remuneration, the expert, businesslike contractor has excellent opportunities for gaining not only a good living but even a fair degree of wealth, and many are the prosperous building contractors that can be found in almost any section of our country. Besides this, what keen satisfaction must this building executive feel when he contemplates this beautiful house, that magnificent church, yonder substantial block that he conscientiously and successfully brought into existence from plans, specifications, materials, and the help of mechanical forces and his trusty men!

Relation to architect. Sometimes on the smaller jobs the building contractor selects or adapts from magazines or books the plans and specifications from which to build, or he may contract to duplicate some actual building selected by the owner. But on all the more important building contracts to-day there is employed an architect who plans and designs the building in all its parts inside and outside to suit the requirements and desires of the owner, and who specifies that the contractor execute in detail what materials are to be used and what methods of construction employed. The architect also oversees regularly the construction as it proceeds; and should there be any differences between the

contractor and the owner he is the deciding authority. However, as the architect is not considered a tradesman but a member of the engineering profession, we shall not discuss him further now, but study his vocation in some detail in Chapter XI, The Engineering Professions.

EXERCISES

1. Which should give a man greater satisfaction — to work as a journeyman carpenter or mason, as a subcontractor, or as a building contractor? Which should pay the best?

2. Learn from your acquaintances who are successful contractors how they would advise a young man to prepare himself to become a prosperous contractor.

3. Why should a contractor understand at least the rudiments of architecture?

4. What business subjects do you think he should master? What mathematics? What sciences? What drawing?

THE JANITOR

Importance of the work. Suppose a rich man had his grounds laid out beautifully by a landscape gardener and the lawns and plants brought to a condition of perfect growth and harmony, how long would his premises delight the eyes if they were left neglected or in charge of an ignorant caretaker? Did you ever see a rich man turn over his grounds to the care of one untrained in such work? If the value of schoolhouses in the United States to-day is over $1,000,000,000, and that of other public buildings is, let us assume, at least ten times as much, what is the wisdom of spending these billions of wealth in erecting beautiful, substantial structures, planned to give abundant service and comfort to millions of human beings, and then turning them over to the care of well-meaning but untrained janitors? Why does the rich man use common sense in securing proper care for his grounds, while the great public

uses none in securing untrained, unskilled care for its valuable public buildings? Not only are they worth billions of dollars, but in them practically all of our youth and many of our adults live most of their waking hours.

The standard of healthfulness in schoolhouses and other public buildings should be that found in the best-kept homes. But our public buildings are cared for by ordinary

An insurance company's home office

It is in caring for such buildings as this that janitor work reaches a high degree of perfection. The heating, lighting, ventilating, and sanitary arrangements are fully organized under the building superintendent, and his position is rightly regarded as one of the most important in the company's staff

unskilled working men without any training in health or housekeeping methods. The State Commissioner of Health of Pennsylvania inspected 3572 schools during the year 1911–1912 and found more than five sixths of them (3036) unsanitary. But the schools in Pennsylvania are no worse than those in other states. Recent studies of schoolhouse air show relative humidity often nearer 20 per cent (which is more arid than in deserts where vegetation never grows) than the normal 40–70 per cent; temperatures more often

in the 70's and 80's (which lower vitality and promote tuberculosis and other diseases with fearful rapidity) than in the healthful 60's; carbon dioxide, indicating stagnant, germ-filled air, more often measuring 20 parts in 10,000 than the normal 4 in 10,000, etc.

Necessity of special training. We agree heartily with Dr. Helen C. Putnam in her book "School Janitors, Mothers, and Health," when she says:

> The training and testing of caretakers of school premises is as logical and imperative a need as is that of teachers, nurses, librarians, drug clerks; or of housekeepers, cooks, and other domestic workers, rapidly coming to pass. It is a vital factor in problems of school hygiene, and is likely to be the most effective means of educating other school officers in sanitation. Salaries paid janitors in large cities, ranging from $700 to $2500 and $3000, average higher than salaries of teachers, post-office employees, or assistant librarians, the formalities of whose appointments are well known.
>
> Among the teachers of janitors it is desirable to include instructors from schools for nurses and domestic science, as the service required is technical and practical, to be held to definite standards which thus far have been demonstrated in these two lines of education. In addition, health officers, biologists, and instructors in physics and chemistry can be of service in creating standards and testing results. It is also important to secure the coöperation of these men and women in establishing classes for janitors on a permanent basis in the right educational institutions.
>
> Every large city has several hundred janitors, not of schools alone, but of apartment houses, office buildings, theaters, churches, and entertainment halls; also Pullman porters, train and street-car conductors, hotel managers. With different grades of examination as in the United States postal service, this course can be adapted to each form of custodial care.
>
> We are seriously afflicted by unsanitary public buildings (including schools) and conveyances. The public good demands that educational and health standards be introduced in these important occupations that have been mentioned.

Employment of trained janitors. A few cities already have placed janitors under the civil service, where examinations are required before appointment. Without doubt very

many cities and quite likely many of our states will in the near future require of prospective janitors of schools and other public buildings training not only in caring for a boiler and running an elevator but also in proper heating, ventilation, and sanitation of buildings, and will then issue licenses and give appointments only to those found proficient.

Attractive possibilities of this occupation. At any rate, now that so many public buildings are palatial, have pneumatic cleaning appliances so that sweeping and dust are practically eliminated, and provide many other conveniences for caretaking, and with the increasingly attractive salaries paid the janitors, would it not be worth while for some of our boys to consider seriously this vocation? Of course we do not mean such work as ordinary janitors are obliged to perform in poorly equipped buildings, where they must work nights, Sundays, and holidays surrounded and permeated with millions of dust particles. The janitor of the future will become more and more the sanitary engineer of a public building, less and less the sweeper and duster; he will be provided with all proper machinery and appliances for his work, so that it will not continue unhealthful; and he will surely occupy an ever higher social plane as he becomes better trained and serves the public more scientifically.

EXERCISES

1. Are the janitors of your school and other local public buildings appointed because of their fitness or because of their political friendships? Talk over with your father and mother what the qualifications of a janitor should be and how he should receive his appointment.

2. Is the work of the janitor in the public schools and public buildings in your locality as a rule very hard? Are the hours long? Is the work dusty and otherwise unhealthful, or the contrary? If it is not in the main free from dust and healthful, how could it be made so?

3. How can a janitor secure right conditions of air? What is the teacher's part in this and in having proper light?

4. Tuberculosis is an indoor disease which spreads most readily in poorly lighted public buildings which have overheated, poorly ventilated and overdry air. Can your class help in any way to combat this disease in your locality or your state?

5. The open-air and the open-window schools are more sanitary than those with closed windows and the most perfect heating and ventilating systems known. Have you investigated any open-air schools? Can you help to secure them in your town or city?

READINGS AND REFERENCES

Books

Adams, Joseph H. Harper's Electricity Book for Boys. Harper and Brothers, New York. $1.75.

Arrowsmith, James. The Paper Hanger's Companion. William T. Comstock Company, New York. $1.00.

Black, John. Masonry. Sampson Publishing Company, Boston. 25 cents.

Clow, George B. Practical Up-to-date Plumbing. Hodgson Book Company, Chicago. $1.50.

Dana, W. S. B. A Primer of Architectural Drawing for Young Students. William T. Comstock Company, New York. $1.25.

Hasluck, Paul N. Practical Graining and Marbling. The Painters Magazine Publishing Company, William St., New York. $1.00.

Hasluck, Paul N. Practical Painters' Work. William T. Comstock Company, New York. $1.00.

Hodgson, Fred T. Modern Carpentry. Hodgson Book Company, Chicago. $1.00.

Hodgson, F. T. Practical Bricklaying Self-taught. Practical Stonemasonry Self-taught. Hodgson Book Company, Chicago. $1.50.

Jarvis, Henry. The Beginners Guide to Carpentry. Sampson Publishing Company, Boston. 50 cents.

Marshall, P. Electric Lighting for Amateurs. Sampson Publishing Company, Boston. 25 cents.

Pratt, Herbert. Wiring a House. Norman W. Henley Publishing Company, New York. 25 cents.

Putnam, Dr. Helen C. School Janitors, Mothers and Health. American Academy of Medicine Press, Easton, Pa. $1.00.

Radford, William A. Cement Houses and how to Build them. William T. Comstock Publishing Company, New York. $1.00.

Sloane, T. O'Conor. How to become a Successful Electrician. Norman W. Henley Publishing Company, New York. $1.00.

Two free bulletins issued by the Printing Department, City of Boston, Mass. These are Rules for Janitors, Engineers, and Matrons, and School Document No. 9, 1912, Report of Special Committee on School Janitors' Salaries.

Periodicals

Architecture and Building. Monthly. William T. Comstock Company, Buildings and Building Management. New York. $2.00 per year.

Electrician and Mechanic. Monthly. Sampson Publishing Company, Boston. $1.50 per year.

Iron Age. Monthly. Iron Age Publishing Company, New York. $1.00 per year.

Metal Worker, Plumber and Steam Fitter. Weekly. David Williams Company, New York. $2.00 per year.

Popular Electricity Magazine. Monthly. Popular Electricity Publishing Company, Chicago. $1.50 per year.

The Bricklayers and Masons Journal. 23 Duane St., New York. 75 cents per year.

The Building Age. Monthly. David Williams Company, New York. $1.00 per year.

The Carpenter. Monthly. United Brotherhood of Carpenters and Joiners of America, Indianapolis, Ind. $1.00 per year.

The Painter and Decorator. Monthly. Brotherhood of Painters, Decorators and Paper Hangers of America, La Fayette, Ind. $1.00 per year.

The Painters Magazine. Monthly. The Painters Magazine Publishing Company, William St., New York. $1.50 per year.

CHAPTER X

MACHINE AND RELATED TRADES

He that hath a trade, hath an estate. — BENJAMIN FRANKLIN

Industry is thrown away if one cannot infuse a high degree of skill into his work. — HAMILTON W. MABIE

In point of history the smith with his brawny arms as strong as iron bands was the first of mechanics. In ancient times he made all the implements of agriculture, of transportation, of the home (including musical instruments) of war, etc. In fact, he was practically the sole manufacturer of all articles in which metal was wholly or partly used. How simple was the life of people then, how inclusive and still not overcomplex were his duties! Now all has been changed, and scores of tradesmen have divided among themselves the complex kinds of work inherited from the simple smith of old.

Leaving out the many variations of the mechanic trades as found in thousands of manufacturing plants, let us survey the following general scheme of work of the leading machine and allied trades:

GENERAL SCHEME OF WORK OF THE MACHINE AND ALLIED TRADESMEN

A blacksmith shoes horses, sells and repairs wagons, sleighs, and farm implements, and repairs tools, machines, etc., and sometimes even automobile trucks and cars.

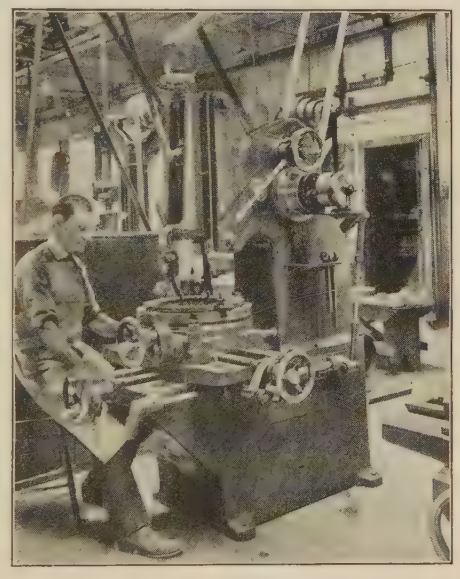
Machine-shop tradesmen. 1. *The machinist* makes, assembles, and repairs tools, implements, and machines, and installs systems of machinery.

2. *A draftsman* plans the details of the tool, machine, or implement to be made, and then places on paper working drawings of the desired mechanism, with full directions of design and dimensions for the machinist to execute.

3. *A designer* is an expert draftsman whose work is to solve in detail difficult or intricate problems of the planning or designing of improved, adapted, or new machines, and then to make working drawings of the mechanisms designed.

4. *An experimental worker* tests proposed changes in the manufacture of any mechanism, in the endeavor to correct any defects, to improve the symmetry of parts or the utility or durability of the whole, or to reduce at any point the cost of production.

5. *A patternmaker* constructs wood models, or patterns, of tool or machine parts, from which a molder makes the metal castings.



A machine tradesman

He is a skilled workman, and with his dependable machine he takes pride in turning out high-grade work. On some particular jobs he works within limits of one one-thousandth of an inch

Other of the machine tradesmen. 1. *The stationary engineer* is a machinist who tends the running and ordinary repairing of a steam engine and boiler in block, factory, or shop and the heating or power system attached.

2. *The chauffeur* and *the truck driver* attend to the running and minor repairing of automobile cars or automobile trucks. They also keep the machines clean and in good running order.

THE BLACKSMITH

Nature and advantages of the trade. Among the advantages that blacksmithing offers we note the following: It provides a fairly well-rounded physical development. The constant improvements in wagons, sleighs, farm implements, and the increasing variety and complexity of objects to be repaired, even to the automobile, require continuous mental development.

Mental alertness is constantly required for emergencies or new demands, the conditions under which any two days' work is done varying greatly.

A comprehensive grasp of the whole interdependent scheme of implements and appliances necessary to rural production and often of general automobile construction is essential.

The work itself breeds in the blacksmith the highest quality of honest manhood or good citizenship, an instant willingness to serve without exorbitant charge the necessities of anyone whose horse requires a shoe, or whose tool, implement, or machine needs repairing.

While blacksmithing has many advantages to offer as a trade, its most serious disadvantages are perhaps its long hours and hard physical toil, with only a fair remuneration, and with no glowing prospects of either a large salary or great wealth. And yet two of these disadvantages are not so great as formerly, since improved machines and appliances are relieving the blacksmith of some of his physical drudgery and are shortening his hours of labor. So we might conclude that if one is strong physically, if he loves the country and mechanical work, and if he is modest in his desires, there is no real disadvantage to be found in blacksmithing. Here one can at least be sure of a good living, and ought to be able to lay up a little against old age.

It certainly looks well for blacksmithing to find so many cases of two and even three generations of a family following

the same occupation. It would have been well not only for the man but also for society if many a poor clerk, or even lawyer, doctor, or minister, had become what his talents qualified him for, an honest, efficient blacksmith.

Training. Like every tradesman and citizen to-day the blacksmith should have, if possible, a sensible high-school education, including, in his case, English, commercial arithmetic, civics, mathematics, science, drawing. If his father or a neighbor has a shop, the boy should help there at odd times, and early become as expert as possible in mechanical work. Before becoming a journeyman blacksmith it will be necessary to qualify for the trade either as an apprentice for three or four years or by taking a two-year or three-year course in a technical or trade school.

Remuneration. Apprentices receive anywhere from $3 to $6 a week, their pay increasing as they become more valuable. Journeymen often set up a shop for themselves or enter into partnership with some relative, but in case they work for another blacksmith their wages may range from $15 to $24 a week. Since many journeymen set up in business for themselves, and take in addition the agency in their community for farm vehicles and implements, their incomes vary greatly from a meager livelihood to a comfortable living.

The machinist-blacksmith. In addition to the general blacksmith just described, — the rough-and-ready jack-of-all-trades mechanic, — there is also a sort of machinist-blacksmith who repairs tools for workmen laying a railroad or constructing a bridge or iron structural building, or who serves as a handy blacksmith anywhere in a factory where forging and general repairing are needed. Although he is a blacksmith, still his life is so different from that of the general smithy that we had better think of him as a member of the machine tradesmen. His wages are often very good, sometimes ranging as high as $6 and even $8 a day.

EXERCISES

1. If there is any general blacksmith in your community, send a representative of your class to learn from him incidents of his apprenticeship; the great changes that have come to his trade the last forty years; the average income of a general blacksmith; the advantages and disadvantages of the trade; what sort of boy he would advise to enter this vocation; and what preparation he would recommend.

2. Send a member of your class to a local horseshoer to learn from him information similar to that gained from the general blacksmith.

3. If there is a local machinist-blacksmith working for a construction company or in a factory, have some member of the class get from him inside information of the same sort.

4. Can you find out who was the "learned blacksmith" of Connecticut, a man who had learned several languages while working at the forge and who was a pioneer of world-wide peace?

5. If you live in the country, compare the prosperity of the local blacksmith with that of his neighbors who are farmers, building tradesmen, and professional men.

6. Has the general blacksmith in your community taken up automobile repairing? If so, find out how he prepared himself for this work.

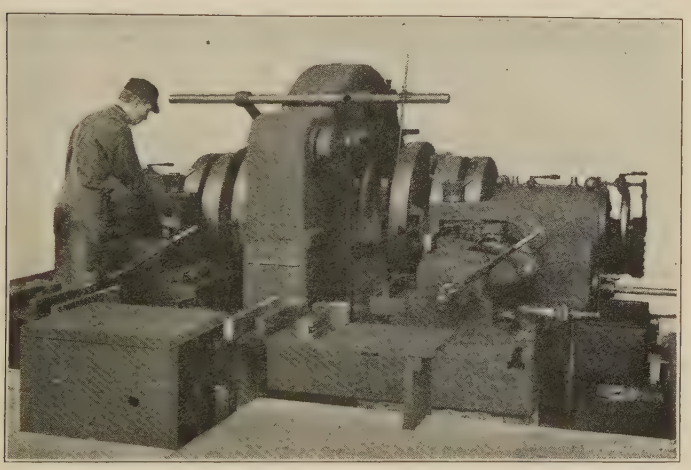
7. Does the local blacksmith have the agency for selling farm wagons, motor trucks, plows, reapers, binders, or other farm appliances?

MACHINE-SHOP TRADESMEN

A few years ago a practical mechanic and expert engineer wrote in the *American Machinist*, "If you know of a bright sixteen-year-old boy, smart and independent, with snap, pride, poverty, good health, and a common-school education, and with a hankering after the mechanical arts, tell him to go into a machine-shop and learn the trade."

Training for these trades. The work of the machine shop is still attractive to the bright boy "with a hankering after the mechanical arts," but unless the poverty of his family pinches too hard he had better not enter upon this trade until he has had more than a common-school education. The boys who have had high-school advantages added to

those of the shop are usually the ones that become foremen, superintendents, and other high-class experts. Instead of learning the machine trades by the old apprentice system, it is better to-day to prepare in a good trade school or by means of a part-time plan, with nearly an equal amount of time spent in the shop and in a trade high school.



The machinist at work

When this workman learned his trade the only plan available was apprenticeship. For three years he served under the direction of foremen, and then was recognized as a competent tradesman, a so-called journeyman

1. *The apprentice system.* A special report on the needs of part-time education submitted by the Massachusetts Board of Education to the state legislature in January, 1913, throws much light on this situation. Let us note some of its statements concerning apprenticeship and part-time education as applicable to machine shops:

The training [of the apprentice] is limited to the kind of work done in that particular shop, or, in some instances, to the particular department or machine on which the young worker is employed. Even where the shops have a sufficiently broad range of work to enable them to give the

all-round experience which is necessary to make a first-class machinist, it is difficult or impossible to maintain such a system of training. All the pressure on the foreman and superintendent is for production, and when it is found that a boy is capable of doing one job well, he will be kept on the specialized machine until he becomes discouraged, and leaves.

Furthermore, this system of [apprentice training] does not furnish enough skilled help for the trade. The demands of the automobile business have drawn large numbers away from the machine shops, and they have not yet been adequately replaced.

Because of the high degree of skill required, together with the ability to do independent thinking, employers of machine-shop help are more decidedly in favor of part-time schooling than any other group. Practical work in the industry has shown that manufacturers who were opposed to the plan a few years ago are now its most enthusiastic advocates.

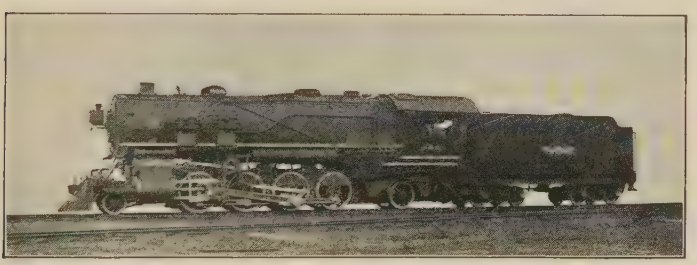
2. *Part-time schools.* There are to-day successful part-time schools connected with machine shops in Fitchburg, Worcester, Quincy, Beverly, Fall River, and Newton (all of Massachusetts), in Cincinnati and Cleveland, Ohio, and in several cities of Illinois and of other states. If you should become interested sufficiently in a machine trade to follow it as a life work, by all means avail yourself of this part-time plan of training, which from the start will mean theory, practice, and wages combined in proper proportions. If this course is not possible for you, then train in a good trade school like those in Bridgeport and New Britain, Connecticut, where theory in class and practice on a large variety of actual contract jobs will give you an excellent preparation for the machine trades.

The interrelation of machine-shop trades. As the general scheme of work of the machine trades on pages 196–197 indicates, the duties of the machine and tool maker, of the draftsman, of the designer and the experimental worker (if the shop is large enough to require these two experts), and of the pattern maker are so interrelated and overlapping that in order to do expert work in any one of these departments the tradesman should have mastered both the theory and

practical work in the other departments. Let us take up first the work of the machinist, or machine and tool maker, and then of the other tradesmen whose work overlaps and interlocks his.

The Machinist

Our dependence upon the machinist and his associates. Handmade articles to-day are few and far between. This is a manufacturing age and we are a great manufacturing people. A vast new country, rich in natural resources and production and occupied by nearly 100,000,000 consumers,



A fine example of the machinist's skill

Every part of this engine, from cylinder and drive wheel to steam gauge and throttle valve, owes its smooth running to his careful hands. His conscientious work makes it possible for us to travel in safety even sixty miles an hour

coupled with Yankee ingenuity and inventiveness, — this is the basis for our enormous manufacturing enterprises. That our industrial activities require millions of tools and machines is very evident, but is the need limited to our industrial pursuits? Can a man farm without implements? Can a mason or carpenter build without tools? Can one travel or send his goods without ships or trains and tracks? Can one live at home, even the simplest life, and not use some tools or machines or things made by their use?

The very necessities as well as the comforts of our lives depend in large measure upon machines, and hence upon

those who make them. All manufacturing depends for its execution upon machinery and tools. Without the machine shops no factory could have been equipped with its machinery. All new tools and machinery are first designed, patterned, molded or forged, and made in a machine shop. All improvements upon these tools and machines are likewise made in such a shop, and so are the new tools and machines required in their manufacture.

So, with the daily demands for new appliances and improvements on old ones, and for tools and machines necessary to build these, the work in a machine shop is a part of an endless chain. For no machine or tool is without its antecedents, and few are likely to be without a long line of descendants. Evidently the day of machines and machinists is not passing; these trades are in either their prime or their early strength.

Work of the machinist. The machinist makes the desired tool or appliance out of metal, usually from drawings furnished by a draftsman, which show every detail of form and dimension. Sometimes it is from a bar of iron or brass that he shapes the major part of the required product. Or his work may be to take metal castings in their rough condition and construct his finished mechanism chiefly from them. Again, he may be asked to repair or duplicate a piece of machinery too fine to be intrusted to a blacksmith. He works with lathes, planers, milling machines, shapers, presses, and many other mechanisms, both machines and tools. The expert tradesman, capable of executing the most difficult and perfect work, has much variety in a day's activity, especially if in a small shop, and must grow constantly in adaptiveness and skill.

The machinist, then, makes, assembles (fits the various parts together), and repairs tools, implements, and machinery, including steam engines and electric motors, either separately or as units in a system of machinery. From his hand

passes the finished product. But from the draftsman he has received his pictured orders, specifications shown in detail on the mechanical or working drawings. Let us now look into the duties of this tradesman.

The Draftsman

The American Machinist has said, "The draftsman's branch of the mechanical designing field is one of the best in the world for capable and energetic young men whose future depends on themselves." And in *The Engineering Magazine* it was recently stated, "The drafting room is a department of very great interest to every manufacturer seeking economy of production because of the large influence it may exercise on the total results."

The nature of the work. The machine maker and toolmaker, or machinist, executes in detail the blue-print orders of the draftsman. If these orders as found on the blue print are either not accurate in their specifications or not true to the mechanical principles involved, then the finished tool or machine will be useless. In the smaller shops the draftsman, and in the larger ones the designer, may be likened to the architect who not only designs the outside of a structure but also plans part by part its corresponding interior and specifies all details of its construction. If the machine draftsman or designer is like the architect, then the machine maker would correspond to the master builder, who executes the orders and specifications of the architect. As the architect must understand in detail all the principles underlying the actual building of the house he has drawn, and all the materials that will enter into its construction, so in drafting a tool or machine the draftsman must know absolutely the mechanical principles involved, the materials to be used, and every other detail of the construction.

The meaning of expert draftsmanship. It means far more to be a draftsman in a machine shop than simply to be able to copy or to interpret mechanical drawings, as some boys imagine. It means in addition to this a mastery of shop mathematics, physics, applied mechanics, strength of materials, engine practice (both steam and internal combustion), and power transmission. In order to tell others what to do or make, one should know all about it himself. So we find the draftsman a man of great value among machine tradesmen.

The Designer

Let us learn more about the designing side of the draftsman's trade, or of the duties of the designer if the shop is large enough to employ this expert. The draftsman may not understand all the fine points about the designing of tools and machines, but the designer must always be thoroughly qualified in all the details of drafting, and he must go farther.

The problems of the designer. To illustrate. The superintendent of a machine shop or perhaps a customer gives the designer this problem: This press (used for cutting or stamping the tops and bottoms of gallon tin cans) is perfectly satisfactory except in this one particular [which is explained]. Now, we want you to design one like it but correct the unsatisfactory feature and make it smaller and adapted to stamp out most economically the tops and bottoms of pint cans. The problem may look easy; but it means ability to apply the principles of mathematics, physics, mechanics, strength of materials, symmetry, and drawing to the end sought, —a machine perfect in symmetry of parts, execution of work, durability, and economy of construction, —and then to draft this on paper with all details and specifications so that the machine maker can construct with unfailing accuracy the desired stamping press.

The problem brought to the designer in the machine shop of an automobile factory might be to adapt the design of a large touring car to that of a small runabout in motor, chassis, and body, so that the desired machine would satisfy the discriminating public and could be sold at about half the cost of the original car. This is, of course, a far more intricate problem; but a designer is an adapter, a most expert mechanician, often possessing the education and qualifications of a mechanical engineer. To design a tool or an intricate machine is not the work of an artist, but the work of a superbly equipped machine architect.

The designer's assistants. In adapting or designing a new automobile, printing press, typewriter, locomotive, or other intricate mechanism, the designer may have the assistance of draftsmen, patternmakers, machine makers and toolmakers, and possibly one or more experimental workers. However, we should understand that only the largest machine shops employ experimental workers, since in the smaller shops their work is done by the draftsman and his assistants, and also that in the smaller shop the draftsman and designer are one person. Now let us glance at the duties of the experimental worker.

The Experimental Worker

Nature of the work. The experimental worker is needed to test, check up, and experiment on changes suggested by the designer, or other authority, in the manufacture of any mechanism. He may try to discover a means to correct some defect in construction, to improve the product turned out by the machine, to increase its durability, or to reduce the cost of its production. Whenever intricate or extensive changes either in the design of some mechanism or in the inner arrangement and equipment of the shop are needed, the experimental worker may be called upon to plan and test out many of the details involved.

There are, of course, experimental workers of all kinds in many large industrial plants outside of machine shops. Edison employs many of them in prosecuting his countless inventions. Numerous chemists are engaged in experimental work in a multitude of factories to improve the product, to lessen the cost of its manufacture, and to utilize any by-products.

Qualifications. This mechanic may be a young mechanical engineer, preferably an experienced tool and machine maker. He may be very original, practical, and skillful, and need few directions except general ones; or he may be simply a skilled mechanical assistant who does well whatever he is asked specifically to do but who has little or no initiative. The first sort is a very desirable man, doubtless in line for promotion to draftsman or even designer, while the other man secures about the average wages of tradesmen in the shop.

The Patternmaker

But we must return to the smaller shop, the best place for the young machinist to become broadly proficient, where we left the machine maker and toolmaker and the draftsman, and examine somewhat the work of the patternmaker.

Wherever metal castings are used, as in making tools, machines, stoves, furnaces, engines, etc., there is needed the services of a patternmaker. Every foundry — and they are legion — requires his assistance, as all castings depend for their form upon his wood models, or patterns.

The nature and importance of the work. In his book "Pattern Making," Mr. C. H. Willard writes:

> Pattern making to-day is considered one of the foremost of all the skilled mechanical trades. The pattern maker must be able to read a drawing and also to picture in his mind what the finished casting will look like when the machinist has completed his work on it; he must

also have knowledge as to how the casting is to be removed from the molding sand in the foundry, where it should be parted in the flask, and when the cores are needed, the shape and size of the cores, and how to construct the pattern so that it will preserve its form and be durable. Some patterns do not need to be made as perfect as others, as only one casting may be required. In a case of this kind the pattern maker adopts the quickest and cheapest construction possible.

The making of all tools and devices in cast metals necessitates the previous making of a pattern. At the present time not only cast metals require a pattern, but frequently stone, brick, mortar, cement, plaster of Paris, rubber, glass, paper — in fact, almost everything that is made in odd shapes requires a pattern. Some men working at the foundry trade are so well trained in their occupation that they can make some pieces without the aid of a pattern, but such men are few.

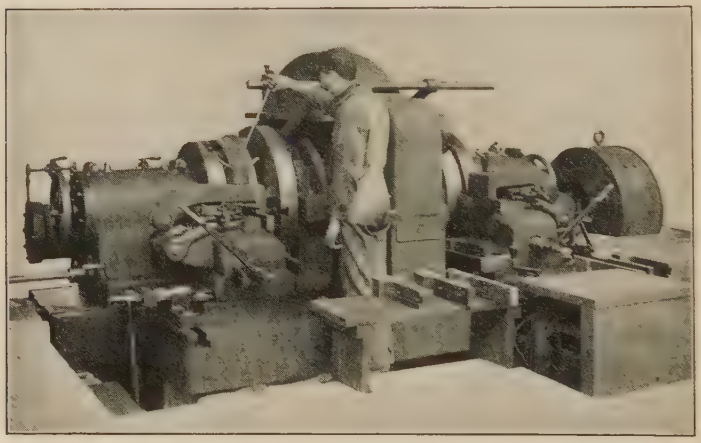
Training. Some large concerns start their apprentice boys in the factory and pass them on to the drawing room, enabling them to obtain an accurate and practical knowledge of drawing, which is quite as essential as the knowledge of pattern making. Some pattern makers spend nearly as much time trying to picture in their minds how the casting should look when taken out of the sand as they do in working at the pattern, while if they had a good knowledge of drawing much of this time would be saved.

From the drawing room the apprentice goes to the foundry, where he obtains a good idea of the best and easiest way to mold a pattern. The pattern maker's education, then, comes from experience in the drawing room and the shops most closely related to the pattern shop, as well as through experience in the pattern shop itself.

This excellent account of the patternmaker's work, training, and importance has doubtless answered many questions in your minds about this trade. We have seen that the patternmaker requires a knowledge of the other machine-shop trades, mathematical accuracy, and great skill in woodworking. This is in many ways a most attractive trade to boys who like to fashion things out of wood. It is clean work, free from dust and from machine accidents; it keeps the faculties keen and the hands dexterous; and it is well paid.

Choice of a Machine Trade and of a Shop

If you have the natural mechanical qualifications and are considering seriously following one of the machine-shop trades, it would be well for you to investigate at first hand machine-shop conditions in your own or any near-by city. In some shops there are so few kinds of mechanisms made that the work has degenerated into a sort of unskilled labor, while



Turning car wheels

Car wheels when first fitted on the axles are rough, and must be smoothed, or "turned," so that they may roll easily on the rails. The machine here shown is very powerful, being run by a fifty-horse-power electric motor, and of course must be operated with care. Yet the man who turns wheels month after month need not be so skillful as the all-round machinist in some small machine shops

in others hundreds of different kinds of tools and machines are constructed in the course of a year, thus rendering the work decidedly varied and of the sort to develop all-round, adaptable, skilled machinists. Occasionally shops are found where the machines are unprotected and dangerous, the metal dust is allowed to fly freely from the emery wheels, and the general hygienic conditions are bad. In some

communities there is a dearth of good machine workers, in others the supply far exceeds the demand. Hence, in deciding what branch of machine work you would prefer, it would be well, after reading this chapter and the references, for you to visit a number of shops and see the different tradesmen at their work.

Remuneration and advancement. As has been said, the demand for skilled tradesmen is excellent in most localities. Advancement is slow or rapid, according to the workman and the shop. Beginners are paid from $3 upwards a week, the average yearly increase for boys being $1 or a little more per week and for men somewhat higher. Journeymen toolmakers and patternmakers usually receive about the same wages — from $2 to $6 a day, depending on locality and other conditions. Draftsmen are often paid a little more, sometimes much more; in cases of foremen, at times as high as $2500 a year. Designers are often still better paid, a few chief designers receiving as high as $7500 a year. The experimental worker, if a helper, is sometimes paid less than the regular machinist; if a chief, he may receive as high as $2000 to $2500.

While the machine-shop trades would not rank as high as certain of the building trades in the matter of health, still they are generally, as we have seen, attractive vocations, improving daily with safer machines and better hygienic shop conditions. As a rule they are not overcrowded, and they offer excellent opportunities to trained young men of the right sort.

EXERCISES

1. In the local machine shops are the belts, gears, and dangerous machines protected? Are the grinding wheels provided with dust exhausts? Does every precaution for safety of limb and preservation of health seem to have been taken?

2. Is the supply of machinists in your town equal to the demand? Is it too great? Is this true of toolmakers, draftsmen, and patternmakers?

3. What large manufacturing plants are there in your town? How many have a machine shop or department? How many employ a designer in addition to the regular draftsmen? How many employ experimental workers?

4. What education have the most expert machinists in your locality received — technical school, high school, or common school? What are their positions? What are their salaries?

5. Why is it better for a young machinist to secure a position in a small shop than in a large one? in one where many kinds of tools and machines are made rather than where only a few kinds are built?

6. The present high industrial organization calls for short cuts and time-saving methods. Just how can a machine shop meet this demand?

7. What is the relation of a machine shop to a factory? In what way is each dependent upon the other?

8. Does a labor-saving machine take work away from skilled mechanics? Does it give them extra work? Explain.

9. Using Professor Schneider's measuring scale (p. 165), how many per cent would you give each of the three leading machine-shop trades? Explain your reasons.

OTHER MACHINE TRADESMEN

The Stationary Engineer

In this day of skyscrapers, large institutional buildings, and countless great manufacturing plants, the steam engineer is as necessary as any of the building or machine tradesmen. It is he who superintends the firemen at the heating plant or manages the power house. Only a few years ago steam engineering presented very limited opportunities to the ambitious youth. To-day there are many demands for technically trained steam engineers qualified to take charge of the mammoth plants producing from 1000 to 75,000 horse power, with lighting, heating, and power auxiliaries. The expert steam engineer at present holds a very responsible position, earns a good salary, and is respected as a skilled tradesman.

Preparation. The steam engineer should understand such subjects as mathematics, mechanical drawing, mechanics, heat and steam, fuel, economic combustion of coal, boiler installation, engine design and management, and other topics of this nature. Such knowledge, moreover, is theoretical, and he must add to it practical experience in the handling and repair of engines and boilers.

When we consider that many steam engineers must in addition be equally proficient in their knowledge of dynamos and motors, because electricity and steam are found to-day side by side in city blocks, factories, and power houses, then we discover that to be a thoroughly equipped steam engineer one must have a broad knowledge of machinery, steam, and electricity. As is true of the machine-shop trades, one can best train for this trade in a part-time technical school course or at a technical school, such as the Pratt Institute of Brooklyn, New York; the Carnegie Institute of Technology, Pittsburgh, Pennsylvania; the University of Cincinnati (part-time courses), Cincinnati, Ohio; the Drexel Institute, Philadelphia, Pennsylvania. Such courses are from two to four years in length, and are less expensive per year than regular college courses. One who has had a high-school education and has the persistence to study alone regularly for months could get an excellent training from a good correspondence school. In this case he could work days and study evenings and at odd times. Many have succeeded in this way, though, of course, it is a very difficult path to advancement.

Nature of the work, advancement, and remuneration. At the start one is usually obliged to work as assistant or fireman. This means hard, dirty work in a hot boiler pit, but it also includes much technical training that counts toward future advancement. The wages here may be from $40 to $65 a month, depending on the position, the man, the locality, etc. To the right man advancement should be rapid, though in all probability he will need to change

employers in order to secure the higher position. This does not mean that a young man should leave his first place, however exacting its duties, until he has learned the most it has to teach him, and until he can obtain a position enough better to warrant changing. During the first few years young people are likely to change their positions too often, in order to secure immediate gains, which later prove permanent losses; while tradesmen in their prime are prone to remain rather too long in the same position. It may be added that the work of assistant engineer or fireman, though somewhat disagreeable, offers excellent opportunities for learning the trade from the chief engineer, if he be of the right sort, and from books during the odd times that the assistant's duties will permit.

After one becomes established as chief engineer in a shop which requires several assistants, the particular advantages of the calling appear. If you have a liking for machinery, especially a great engine which seems to be both a giant friend, possessed of unthinkable power, and a docile, efficient servant doing your will perfectly and obedient to your slightest touch — then assuredly you will find the work satisfactory. Of course now and then the giant companion will be out of sorts and will need humoring, or, to change the figure, his harness may not be equal to the load and may require mending. But day in and day out there are only enough mechanical difficulties to keep the engineer mentally alert and mechanically skillful. These serve to give the work variety, and make the calling more desirable for expert enginemen.

The hygienic conditions usually are good, the danger from accidents is not great, the employment is continuous, the length of an active career is usually many years, and the salary in an increasing number of positions is attractive. Stationary engineers receive from $60 to $125 a month in the smaller positions and from $100 to $200, and in a few

cases even more, in the large power houses and manufacturing plants. As in many other trades, the demand and supply of workmen in any locality affect greatly the wages paid. So, in order to get such accurate information on this point as would serve your purpose, you must investigate at first hand the actual wages paid firemen and engineers in your city or section.

EXERCISES

1. Visit any large manufacturing plant, power house, or city block, where a stationary engine is installed, and inspect the boiler and engine rooms. Compare the hygienic conditions there with those you find in machine shops. Which are better? In which would one be more liable to injury from machinery? In which does the work seem more agreeable to you? In which are the opportunities for advancement more favorable? In which does the skilled mechanic receive better pay?

2. Using Professor Schneider's occupation scale (p. 165), how high would you rank the work of the fireman? of the engineer?

3. Is this vocation likely to become overcrowded in the near future? Give your reasons.

4. Which should you prefer — the work of a strictly steam engineer or of a steam-electric engineer (the mechanic who has charge of both steam engine and electric dynamo and motor equipment)? Compare the relative advantages and probable future of these two kinds of engineer.

5. Do you know any fireman who has worked up to chief engineer by studying steam engineering from a correspondence school at odd moments and evenings? If so, ask him to tell you how he did it, and what it cost.

The Chauffeur and the Motor-Truck Driver

Growth of automobile industry. The output of motor cars by American factories during 1914 reached the enormous total of 500,000, which, added to the total of approximately 1,400,000 cars which were in use at the beginning of the year, brings this country within reaching distance of the two-million mark, a staggering total for a type of vehicle which a few years since was regarded as a curiosity.

Demand for chauffeurs. In such an extensive, rapidly growing industry it is evident that there are numerous opportunities for profitable employment, and that the demand for *well-qualified* chauffeurs must greatly exceed the supply. To-day many automobile owners are forced to accept the expensive service of poorly prepared and otherwise incompetent

Driving a motor truck

Motors in the United States used for freight now number about 60,000. Since as yet only 1 per cent of the animal power represented by horses and mules has been displaced, it seems that motor trucking is still in its infancy and that the demand for competent drivers will steadily increase

drivers; and yet we must not ignore the fact that, however great has been the demand for competent chauffeurs, from now on an increasingly large proportion of people of moderate means who are going to buy cars will prefer to drive the cars themselves.

A large automobile company, whose service department is thoroughly in touch with motor-car conditions throughout the United States, makes the following statement:

Remuneration. A good chauffeur will often receive higher wages than if employed in a factory or elsewhere, this holding true especially when the man is not a skilled mechanic. A careful driver willing to be on call during the day and evening, a man who takes good care of his car and is obliging, may earn up to $35 a week.

As to the wages given a man at the start, this depends very much on the man himself, in fact this holds true in every phase of the matter. We should say that men receive from $10 to $18 at the beginning. Drivers of average success eventually receive from, say, $18 to $22, and occasionally much more than this, as intimated in the beginning of this letter. Many men fit in so well that they receive wages beyond what would ordinarily be paid them for the mere work of driving alone. There is a good demand for capable men.

Training. A good driver obtains his mechanical knowledge of cars either in a shop or garage, or in an automobile school. For example, a man who has worked in our repair shop and who is given an opportunity to drive a car should become a good chauffeur. He can get more or less the same training by getting employment in a repair shop of some garage. The time required for this special preparation depends naturally on the aptitude of the man and his previous employment. A mechanic with some experience in a machine shop will naturally pick up the details of an automobile quicker than a man without such training. In the case of a man who is not a mechanic it might take, say, from three to five months.

There are automobile schools where men are trained to become drivers. Their charges vary. In our city there is one which charges $25 for the course. In this case there are no stipulated number of lessons or number of weeks, but the man is taught to drive and look after a car. If he is a mechanic he may pick up enough in from two to four weeks. The Y.M.C.A. here has an automobile course for which no charge is made.

Demand for expert drivers. You will understand that it is a relatively simple thing to drive a car. It is more difficult, however, to tell when there is something the matter and how to remedy it. Some men are little more than drivers, but a good chauffeur understands how to put his car in order and will keep it in order. Men who are capable and careful drivers, who keep their machines in perfect order so that the best service may always be obtained from them, whose habits are good, etc., etc., soon become known as desirable men and not only draw good wages but are hired permanently Inferior men are often let go in the winter and find positions from place to place. There is a wide difference in the capabilities of drivers.

A well-qualified chauffeur appreciates what it means to drive this strong yet intricate power plant, the automobile, and to keep it in perfect adjustment. Such a driver sees to it that the ignition system is in perfect order, that the carburetor produces a suitable explosive mixture, that the water circulation is right, the valves and bearings in good shape, the supply of oil adequate, etc. The demand for his services without doubt will increase for years to come since most owners now realize that it is cheaper to employ a capable, technically educated driver at a good salary than a comparatively ignorant one at a smaller salary. The latter costs too much in repair bills, delays, and general dissatisfaction to hope to secure the satisfactory position and salary open to the qualified chauffeur.

Advantages and disadvantages. No doubt this vocation has its attractions — the work is light, it is performed in the open air, and one's employers are often people of refinement. Yet this fact must also be taken into consideration —the young man is often brought into contact with people who are spending money extravagantly, and after a time he is liable to value the dollar somewhat lightly. His views of life and his manner of living are likely to be influenced largely by those of his employer and others of the same class. Unless he is a young man of considerable backbone, he may live beyond his means, become greatly dissatisfied with his station, and get into some very serious trouble. At any rate, it is well to weigh all points before choosing this vocation for life.

The advantages of motor-truck driving. But we must also at least glance at the work of the motor-truck driver. Although his duties may seem less desirable than those of the pleasure-car driver, there are these advantages to be considered: more regular hours of employment, good demand for drivers, a regular vacation period, a greater personal independence in one's work, and less danger from reckless driving.

EXERCISES

1. Have the chauffeurs and truck drivers you know held the same position for several years? Are they getting good salaries? Have they any expectations of further advancement in salary? Would they advise you to enter the same trade?

2. In your locality, which is considered the better occupation, that of chauffeur or of truck driver? Which is better paid as a rule?

3. What schools, if any, are there near you that train auto drivers? How long is the course? How thorough?

4. In a few years, when nearly all the wealthy people who would employ chauffeurs have bought their cars and employed their drivers, will the demand for additional expert chauffeurs with good salaries continue or decline? Give in full the reasons for your answer. Should this prospect affect one's choice of this vocation for his life work?

5. Which of all the trades presented in this chapter do you consider the best one? Explain fully your reasons for this preference.

READINGS AND REFERENCES

Books

Adams, Joseph H. Harper's Machinery Book for Boys. Harper and Brothers, New York. $1.75.

Compton, Alfred G. First Lessons in Metal Working. John Wiley and Sons, New York. $1.50.

Dyke, A. L. Automobile Encyclopedia. The Motor Vehicle Publishing Company, New York. $3.25.

Holmstrom, J. G. Modern Blacksmithing, Rational Horseshoeing, and Wagon Making. Frederick J. Drake and Company, Chicago. $1.00.

Tolman, W. H., and Guthrie, A. W. Hygiene for the Worker. American Book Company, New York. 50 cents.

Willard, G. H. Pattern Making. Popular Mechanics Publishing Company, Chicago. $1.00.

Willard, W. F. A Practical Course in Mechanical Drawing. Popular Mechanics Publishing Company, Chicago. 50 cents.

Windsor, H. H. The Boy Mechanic. Popular Mechanics Publishing Company, Chicago. $1.50.

Pamphlets

Automobile Running. International Correspondence Schools, Scranton, Pa. Free. (Instruction books are issued and distributed free of charge by all automobile manufacturers.)

Steam Engineering. International Correspondence Schools, Scranton, Pa. Free.

The Machinist. *Bulletin No. 1* of the Vocation Bureau of Boston. 10 cents.

The Needs and Possibilities of Part-time Education. A special report submitted to the legislature, January, 1913. Massachusetts Board of Education, Boston. Free.

Periodicals

Automobile Dealer and Repairer. Monthly. The Motor Vehicle Publishing Company, New York. $1.00 per year.

Machinery. Monthly. Industrial Press, New York. $1.00 per year.

Popular Mechanics. Monthly. Popular Mechanics Publishing Company, Chicago. $1.50 per year.

The American Blacksmith. Monthly. The American Blacksmith Publishing Company, Buffalo. $1.00 per year.

The American Machinist. Weekly. Hill Publishing Company, New York. $4.00 per year.

The Scientific American. Weekly. Munn and Company, New York. $3.00 per year.

CHAPTER XI

THE ENGINEERING PROFESSIONS

If it will go ten miles without stopping, I can make it go around the globe. — SAMUEL F. B. MORSE

The whole of the material needs of humanity, and many of its intellectual requirements, are either satisfied through the labors of the engineer, or are under obligations to these labors. — SIR FREDERICK BRAMWELL

For the comforts and conveniences of our daily life we are without doubt greatly indebted to farmers, builders, architects, merchants, and manufacturers. Countless workmen in these vocations toil for us. However, just below the surface of things, if we but investigate, we find that various members of the engineering professions are rendering distinctly necessary services.

Engineering achievements. Before the manufacturing can begin, the mechanical engineer must first plan the factory, and design and install the special machinery and equipment necessary for the manufacture of the desired product. If electricity should be needed to any considerable extent in the operation of the factory, the electrical engineer also would contribute his valuable assistance. Or should the processes of manufacture involve chemical reactions, as in making paints, petroleum products, explosives, plasters, casein products, substances from cellulose, nitrates from the air, new products from denatured alcohol, synthetic rubber, etc., then the help of the industrial chemist would be required.

In the smelter we should need, in addition to some of these engineers just mentioned, the services of the metallurgical engineer to adapt and to direct the best method of

extracting the mineral from the ore and of giving it the qualities desired in the market. And again, before the metallurgical engineer could extract the mineral from the ore, the mining engineer must already have made his contribution — he must have discovered the valuable mineral lands, planned a way to mine the ore, directed the mining, and finally rendered the ore fit to be further worked upon in the smelter.

The Pennsylvania Station, New York City

In itself a masterpiece, yet remarkable chiefly because of the tunnels which connect it with New Jersey. In the distance one sees the Hudson River and the Jersey hills

Next, let us consider our water supply, the disposal of the city's sewage, the laying out of streets, electric lines, parks, subways, elevated roads, and other municipal necessities and conveniences; there is at once suggested to us the vital contribution made by the city engineer. In our thought, let us take a trip on the nearest railroad, or mail a letter, or send some article of merchandise by express, and straightway we discover our indebtedness to the Herculean labors of the civil engineer. Do you realize that every ten miles of railway of the 250,000 miles in the United States has marked some

engineering achievement — some tunnel or bridge, revetment or cut, built under almost inconceivable conditions and often at a cost of several millions of dollars! As a fact, there seems to be no obstacle or combination of obstacles too great or too complicated to be overcome by that little group of silent, earnest thinkers and planners who build our railways.

To mention a bridge and a wonderful tunnel, consider for a moment spanning the St. Lawrence River at Quebec with a cantilever bridge 1800 feet, or over a third of a mile, in length, and boring the Simplon Tunnel between Italy and Switzerland, 12¼ miles long and in the middle several *miles* below the surface! In fact, this tunnel marks the culmination of one of the greatest of all civil-engineering feats, the greatest tunnel-boring enterprise of any age, ancient or modern. To come nearer home, let us consider what an enormous engineering task it was to build the subaqueous tunnels about New York City, particularly those of the Pennsylvania Railroad, with their cast-iron tubes, 23 feet outside diameter, nearly one and a sixth miles long, piercing the deep underbed of the Hudson River.

These are but representative of the grandest bridges and the most significant tunnels with which our engineers have served mankind. If we consider other bridges, there are four noted ones in and about New York City alone, and there are scores of similar ones suspended or arched wherever our country has thus far needed them. Of the tunnels, approximately 100 miles have been constructed in America alone.

While our railroad and other land traffic requires mighty bridges (like the cantilevers over the St. Lawrence, in our country, and over the Firth of Forth in Scotland) and extensive tunnels (like those under the Hudson River at New York City or the Mont Cenis in the Alps or the Simplon, the greatest of them all), our transportation of people, of ideas, and of things across the seas demands leviathan

ships, serpentine submarine cables, and short-cut canals surpassing almost the power of conception.

From 1850 to 1860 the ocean steamships were of wood, with paddle wheels, and measured from 275 to 375 feet in length. That is, they were all of this size except the *Great Eastern*, which was constructed especially for laying the Atlantic cable. At this point we should remark that since the *Great Eastern* made possible the first Atlantic cable, there have been laid in various parts of the world a quarter of a million miles of submarine cables! This vessel, completed just before 1860, was nearly 700 feet long; but being a side-wheeler and a crude affair in other respects, it was so unsatisfactory that no more ships were built of that length until more than forty years later, when the steel ships *Deutschland* and *Baltic*, with their twin screws and many improvements, were launched, the first being 650 feet and the second 700 feet in length. In 1913 there was completed the *Imperator*, 919 feet long, and in 1914 the *Vaterland*, 950 feet, and the *Bismarck*, 955 feet long, each equipped with turbine engines and four screws.

Our engineers have now perfected for us mammoth sea palaces, with all the comforts and luxuries to be found in a modern city, which, laden with thousands of human beings and millions of dollars worth of merchandise, are driven from continent to continent in five or six days. From small and frail wooden ships propelled with paddle wheels to the gigantic palatial *Bismarck* — this has been the record achieved in a half century by the marine engineer!

But some ocean routes at best are too long, so the engineer was appealed to, and, as always, he rendered the desired service. There was dug at a cost of $100,000,000 the 90-mile ship canal across the Isthmus of Suez, and the route around Africa became unnecessary for vessels sailing east from the Atlantic to the Indian or the Pacific Ocean. This was a wonderful achievement, and contributed beyond

computation to the world's transportation facilities. But centuries before the Suez Canal was built, in fact some four hundred and fifty years ago, Columbus dreamed of a much shorter route to the East than the one traversed in his day. He was mistaken; but his dream in part at least has been realized, and that shorter route to and from the Far East has become a reality, and rounding South America is no longer necessary for the world's merchant marine. The building of the Panama Canal, which is not so long as the Suez, was perhaps ten times as great an undertaking because of the uneven surface to be traversed and the greater depth and width of the waterway. With honest pride we can point to the fact that in this most difficult engineering task — civil, mechanical, electrical, and (of equal importance) sanitary — America has achieved an unprecedented success.

After we have glanced over other prominent features of the engineering field and have noted the telegraph, whether by wire or by cable or by wireless; the telephone, long-distance, local, and wireless; the great reservoirs, like the Ashokan, to supply New York City, or the Shoshone, for irrigation purposes in Wyoming; the harnessing and distributing of Niagara's seven and a half millions of horse power; the Metropolitan Life and the Woolworth buildings in New York City, the first 50 stories, or 700 feet, the second 55 stories, or 750 feet, above the sidewalk; Edison's invention of a complete house made by one gigantic pouring of cement, etc. — we begin to realize the vast extent of our indebtedness to the engineer. He has wrought mightily with the material foundations furnished by nature, and made it possible for the farmer, the mechanic, and the commercial man to produce more easily the products upon which our well-being depends.

Attractiveness of engineering as a profession. The engineering professions, offering as they do construction work throughout our vast new country, appeal with great force to

the eye, and thrill the imagination of many a vigorous, manly youth. To invent, to construct, to create, and that in the large — what could be more worthy of our superb young manhood, with its red blood and big muscles! So it is not strange that Mr. Orison Swett Marden, for years

Tunnel under the Hudson River

This tunnel consists of enormous iron rings, each two and a half feet long and weighing fifteen tons, bolted into place as the huge shields with which the tunnel was bored were pressed forward by hydraulic rams. So accurately did the engineers work that the two sections, though they started over five miles apart, one in New York and one in New Jersey, met under the river with a variation of less than one inch. A thousand railroad trains now pass through the Pennsylvania's four tubes daily

editor of *Success*, received more inquiries regarding the various engineering occupations than any other, and also that throughout the authors' experience as high-school principals, they have been plied with many more questions concerning the choice of an engineering profession than of any other kind of life work.

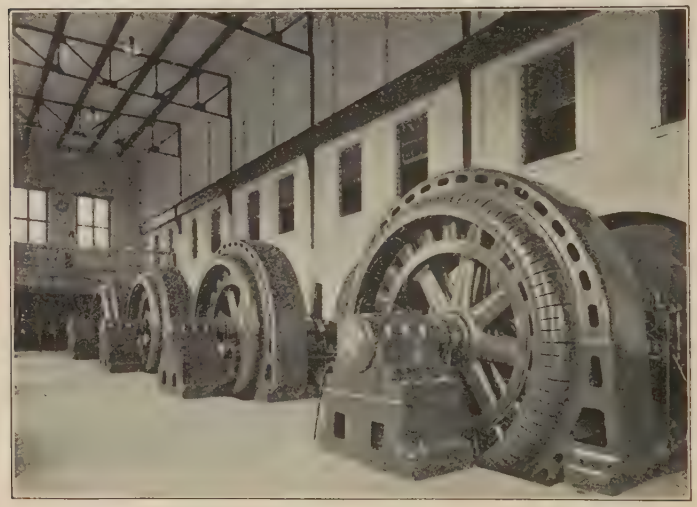
Development from original military and civil engineering. For centuries there were but two kinds of engineering known — military and civil. Military engineering, which is infinitely more complex to-day than formerly, covers the broad field of designing and constructing all fortifications, vessels, machinery, weapons, etc. used in war on land or sea or in the air. But a treatment of military engineering is outside of our present scope. To get an idea of the extent and variety of the work performed by the civil engineer of 1828, let us read Thomas Tredgold's enumeration of the engineer's activities written at that time for the charter of the Institution of Civil Engineers of Great Britain: "Civil engineering is the art of directing the great sources of power in nature for the use and convenience of man, as the means of traffic and production in states, both for external and internal trade, as applied in the construction of roads, bridges, aqueducts, canals, river navigation, and docks, for internal intercourse and exchange, and in the construction of ports, harbors, breakwaters, and lighthouses, and in the art of navigation by artificial power for the purpose of commerce, and in the construction and adaptation of machinery, and in the drainage of cities and towns."

Manifestly, until recent years the term "civil engineering" was regarded as covering the entire engineering field, with the exception of military engineering; but we recognize that what were then merely branches of the calling are now distinct and separate lines of engineering activity, and to-day we distinguish between the civil, the municipal and sanitary, the mechanical, the electrical, the mining, the metallurgical, and the architectural.

General field of work of the engineering professions. Here we shall present a general scheme of the work performed by each of the engineers whose vocations we shall treat, indicating only the principal duties of these men and remembering that in actual practice their activities often overlap.

The civil engineer makes surveys and maps of land and water; plans, constructs, and maintains roads, railroads, canals, tunnels, bridges, lighthouses, aqueducts, hydraulic works, irrigation systems; and improves rivers and harbors. Besides the foregoing, which are his specialties, he may also, because of his general training in the engineering field, be intrusted with any of the activities outlined below and belonging more particularly to the special engineers, under whom we have placed the work.

The municipal and sanitary engineer has to do actually or potentially with the designing, construction, and direction of city highways, parks,



A modern power plant

Electricity in a multitude of ways serves industry. Everyone should know something about it, and the specialist will find in it many attractive vocational opportunities

waterworks, sewerage systems, ventilation of subways and tunnels; he studies and gives expert advice on the milk supply, epidemics, the smoke nuisance, etc.

The mechanical engineer deals with the generation and transmission (except electrical) of power from fuel, water, or wind; he invents and designs tools, machines, engines, etc. and the means of their manufacture; he has charge of the design, construction, equipment, and operation of machine shops, manufacturing plants, and power houses.

The electrical engineer is concerned with the design, manufacture, installation, and operation of electrical machinery and appliances; with

the transmission of messages by means of telephone and telegraph (including cable and wireless); with the transmission of power (including electric traction, electrification of steam railroads, electric-motor drive, and electric lighting).

The mining engineer locates valuable mineral lands; explores and tests the deposits; adapts in each case the proper methods of mining; installs all machinery, appliances, and power; plans and directs the drilling, blasting, breaking, hauling and hoisting, drainage, support of overhead rocks and earth, ventilation, safety, lighting, healthful conditions, the securing of profitable ore-bearing rock, ore dressing and milling, and the mechanical preparation of the ore.

The metallurgical engineer tests and samples ores; selects or adapts in each case the best methods of extracting the metal from the ore; improves smelting machinery; effects greater efficiency and economy in the processes; designs and installs the smelters and equipment; plans and directs the actual extraction of the metals and regulates their chemical composition, giving them the distinctive properties desired in the market.

The industrial chemist works out and improves the manufacturing processes which depend wholly or partly upon chemical reactions; converts factory by-products into marketable commodities; designs, installs, and operates plants and appliances to carry on chemical reaction on a large scale; and gives expert judgment on manufacturing propositions, processes, and plans from the combined viewpoint of the chemist and the engineer.

The architectural engineer, having a practical understanding of the trades involved in constructing, equipping, and decorating buildings and of all the materials required, designs large buildings in accordance with their proposed uses and the principles of beauty, economy, stability, and sanitation, drafts working drawings and writes out in detail the specifications of their construction; oversees regularly the building operations as they proceed; and is the deciding authority on any matters of difference between the contractor and the owner.

THE CIVIL ENGINEER

Among the particular advantages afforded by civil engineering may be mentioned a varied and healthy life, work of an interesting character, and the satisfaction that comes to the designer and builder of what will benefit mankind. Its most serious disadvantages are probably the nomadic life

frequently required of construction engineers and the quite general inability to amass a fortune in the practice of one's profession. This latter objection, however, can be obviated if in addition to his technical training, the engineer develops business ability.

Remuneration. The young engineer, upon the completion of a course in a first-class technical school, starts at a salary of from $60 to $100 a month, on the average probably $65. The demand for well-trained engineers is always good, while advancement in the profession would probably be rated as slow, but more rapid than in law, medicine, or theology. In their prime, civil engineers of average success could expect an income of from $2000 to $4000 a year, while a limited number of especially successful engineers have received as high as $50,000. Not only is the annual salary attractive but the life income is worthy of special consideration, as the average active career in this healthful profession is often as much as forty years.

Natural qualifications and training. Among the natural qualifications required of the civil engineer, we should mention good character, health, analytical ability, executive ability, and common sense. It would help him much if he could add to these a pleasing personality and the ability to mix well with other men, and to present his opinions in clear, vigorous English. Besides a four-year course in a high school, the young man preparing for civil engineering should master the four years of work provided in a good institute of technology, or instead he might spend three years in a college, taking general-culture subjects (including pure mathematics and sciences), and then follow this with at least two years in a first-class technical school. The cost in the technical school would depend very largely on the one attended; at the Massachusetts Institute of Technology, Boston, it is about $300 per year in addition to living expenses.

THE SANITARY ENGINEER

Nature of the profession. Within the last quarter of a century a new profession has come to the fore — sanitary engineering. It represents the application of a new science, bacteriology, to a new product of civilization, the modern city. To give a simple adequate definition of sanitary engineering is difficult. From an early application to plumbers and expert drain layers, the term has grown in importance as the works have grown in magnitude, until it now includes the operations of civil engineers engaged in providing public water supplies, sewerage systems, garbage-disposal plants, methods of cleaning streets and draining swamps, as well as the activities of those engineers whose interests are chiefly indoors, and who are engaged in providing systems of plumbing and ventilation for buildings. The sanitary engineer himself might be defined as one who adapts the forces of nature to the preservation of the public health, through the construction and operation of engineering works.

Training required. The problems of the sanitary engineer are so vast and so varied, they bring him into contact with so many branches of science and with so many classes of people, that an exceptionally broad education is demanded. Not only must he be versed in mathematics and mechanics but he must also have a working knowledge of parts of chemistry, biology, bacteriology, microscopy, meteorology, geology, hygiene, preventive medicine, and vital statistics. Unlike other branches of engineering, sanitation is concerned not alone with iron and stone and other inert building materials but with organic matter and living beings. The purification of water and sewage is due largely to biological action, and a knowledge of bacterial processes is scarcely less important to the sanitary engineer than that of the laws governing the flow of water in pipes and the strength of materials.

Demand for sanitary engineers and associates. Sanitary science is becoming so important that there is room not only for the constructing engineer but also for the sanitary specialist, and for men whose duty it is to operate the works after they are built — to take charge of the water filters and the sewage treatment plants, to manage the garbage works, and to superintend the cleaning of streets and buildings. The need of capable managers of sanitary plants will soon be a pressing one, and our technical schools must be prepared to furnish men for this service. It is believed that young men who study sanitary engineering with thoroughness will find that it affords them opportunities for useful service and a comfortable livelihood.

THE MECHANICAL ENGINEER

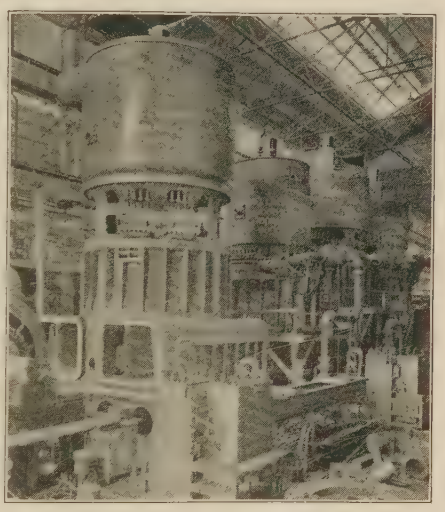
Professor Edward F. Miller, of the Massachusetts Institute of Technology, writes concerning mechanical engineering as follows:

Demand and remuneration. The Institute has for about ten years had a faculty committee whose duty it was to see that the graduates were properly placed. The demand for graduates has increased so that at the present time nearly all of the graduates in mechanical engineering are placed before their graduation. During the present year every man had at least three openings and some as many as seven. The average would be somewhere around five.

Mechanical engineering is probably one of the broadest of the engineering subjects, civil and electrical being minor details and specialties of mechanical engineering. This may be one reason why mechanical engineers fit into so many positions. The engineering professions are not as well paid as are certain other lines of work. In general, the men graduating start in at a salary of from $65 to $75 a month which increases, so that at the end of three years the average salary of the entire class would probably be from fifteen hundred to eighteen hundred, some men, of course, getting salaries of five to six thousand. There have been statistics compiled by certain of the classes, as to the rate of increase of salary of certain classes, and the average salary at the end of ten years

has, according to my recollection, been something over five thousand. This average was no doubt raised by certain men in the class who received rather unusually high salaries.

Natural qualifications and training. As to the qualifications, a man should have, of course, a liking for mechanical work, and should especially enjoy both mathematics and physics. A man who has difficulty with mathematics or geometry is not likely to succeed in mechanical engineering. As to the preparation required, nearly all the high schools give a man a sufficient preliminary preparation. At present a great many men are entering the Institute of Technology after having studied one or two years or, in some cases, after having taken a degree at some college. These men usually enter in the third year. By this means the men get the advantage of college life and a good broad training, and are better able to take hold of the special work than some of the younger men who have not had the broadening influence and training of the college.



A public-service power house

This plant supplies light to the city and power to the street-car lines. Such plants are now to be found in every city of any size, and after a time will be possessed by even the small towns

THE MINING ENGINEER

To many men no vocation affords so much fascination and such varied and interesting experiences as that of the mining engineer. Its disadvantages are its long periods of absence from home and civilization, the gambling tendency which may attract some men engaged in mining promotions, and

the liability to personal injuries, which, though considerable, are perhaps no more common here than in other fields of engineering.

Remuneration and demand. Graduates of mining schools start at a salary of from $60 to $100 per month, and even more in exceptional cases. After the first year they should receive from $100 to $150, which would increase with the individual's ability, quite rapidly in the majority of cases, until in their prime men of average success would have a yearly income of from $3000 to $5000. Of course, here as in other professions, the few who are exceptionally successful sometimes receive anywhere from $10,000 up to $50,000. The demand for engineers is excellent, many men being placed before graduation and as a rule all graduates finding steady work during the long career of from thirty to forty years which is often the lot of the mining engineer.

Personal qualifications and training. The young man purposing to enter this profession should have good health and a sound constitution; he should be willing to undergo physical exertion and to do without many of the refinements and social pleasures available in cities. On the other hand, he should also be able to enjoy thoroughly the exhilaration of life in the open air and of struggle against the forces of nature. He should be a close observer, a clear thinker, with sound judgment and some originality, capable of planning, and able to handle men.

In addition to completing the high-school course, he should spend four years in a first-class mining school, where the cost, depending on the institution selected, will be from $500 per year up, including tuition, board, and room.

THE INDUSTRIAL CHEMIST

While there are in the United States to-day more than 100,000 doctors and 125,000 lawyers, there are only 10,000 chemists to carry on a work vastly more important than litigation or its prevention, and equally as beneficial as medicine to the life of the ordinary community. Do we realize that the annual production of the chemical industries in our country is already almost equal in value to our agricultural products and that it is increasing most rapidly? And do we also appreciate the fact that many of these benefits or victories in the field of chemistry have come, as many others will come, simply because our chemists have never faltered in following for years the slender and often broken thread of an hypothesis here and there through labyrinth after labyrinth of difficult research work?

Remuneration and demand. After a university course the young industrial chemist starts at a salary of from $720 to $1200 per year, according to his ability. The demand for chemists is such that capable men are placed before they graduate. The opportunity for advancement likewise is rapid. The introduction of efficiency methods in one paper mill caused the appointment of six additional chemists. The recent tariff act is forcing manufacturers to improve their products and to devise economies, and hence is requiring additional chemists. Many factories are promoting chemists already on the staff to take charge of new departments and new laboratories — here again causing a demand for additional men. The salaries of men of average ability in their prime present an exceedingly wide range. Men who have good business ability, in addition to their professional training, obtain high executive positions and some become officers in our gigantic industrial corporations. In general, industrial chemistry pays its capable men perhaps the best incomes of any of the engineering professions.

Personal qualifications and training. To be successful in this profession one should possess an inborn liking for or bent towards the science of chemistry. He should be so constituted that the most interesting study in the high school and in his freshman year at college is chemistry. The particular group of mental attributes that should be his are not so different from those needed for success in other lines of engineering work — well-developed powers of observation, good reasoning faculties, keen insight, the commercial sense, a strong imagination, and, finally, strong self-reliance and initiative.

Following a high-school course, he should receive from four to six years' training in university and technical school. If he can afford the expenditure of time and money, he will find three years of academic work and three years of technical training none too much to equip him adequately for his profession. Tuition, board, and room in a good technical school cost from $500 up, the state universities being the least expensive.

THE ARCHITECTURAL ENGINEER

Professor Frederick W. Revels of Syracuse University, one of the two architects who designed the great stadium at Syracuse, makes the following statement concerning his profession:

Nature of this profession. Architecture as a profession is, in a sense, the *greatest* and *broadest* of them all, in that it requires the best preparation possible and eventually a most comprehensive knowledge of the varied activities of life controlling the requirements of design or construction for every conceivable sort of building. This sounds big; but these requirements are being met by some of our younger American architects as a result of extensive preparation and training at home and abroad.

The true architect is an artist, and the gratification of creating an artistic design is the thing he strives after. There is still great need for

just such trained architects and artists, and this need will increase as our country expands and prospers. We are but at the beginning of our architectural development, and the American public is coming more and more to understand the importance of employing a first-class architect when it contemplates building a home, a place of business, or a great railroad terminal. The architect is the man who possesses, or should possess, the necessary knowledge and experience to design and carry out a great operation such as the New York Central Terminal Station in New York.

The Grand Central Terminal, New York

An architectural triumph not only in the beauty and convenience of the buildings but also in the fact that while the plans were being executed 800 trains were kept running and 100,000 passengers handled daily. Trains pulled by electric locomotives reach this station from the north, but the tracks are depressed and it is planned to erect gigantic office buildings above them. Under the street in front of this station run three tiers of subways

Remuneration. Men of ability and some practical experience are securing good positions upon graduating from their course in architecture. A fair beginning salary is $12 to $15 per week, which increases to $25 and $35 or more. Some head draftsmen in the larger offices are paid as high as $75 per week. A practicing architect is paid a commission on the cost of building or operation. The fee of the American Institute of Architects ranges from 5 per cent to 6 per cent of the total cost.

Training and its cost. Any young man who contemplates going into this profession ought to have the best preparation possible. It will tell in after years. First comes the high-school work, with special attention to drawing, mathematics, and some modern language, French preferred. If possible he should combine a college academic course with a course in architecture. Many cannot take the two courses, and the next best thing is a thorough preparatory course and the college course in architecture, and after that travel and study abroad if possible. Foreign travel and study generally come a few years after graduation, when considerable experience has been attained.

The cost varies considerably, being perhaps $400 to $450 per year minimum. Quite a few students work their way entirely. The catalogues of the various schools will be sent to anyone on application; they contain much information as to cost, etc. The college preparation should be first-class and thorough. Most of the high schools fulfill the requirements.

PREPARATION FOR AN ENGINEERING CAREER

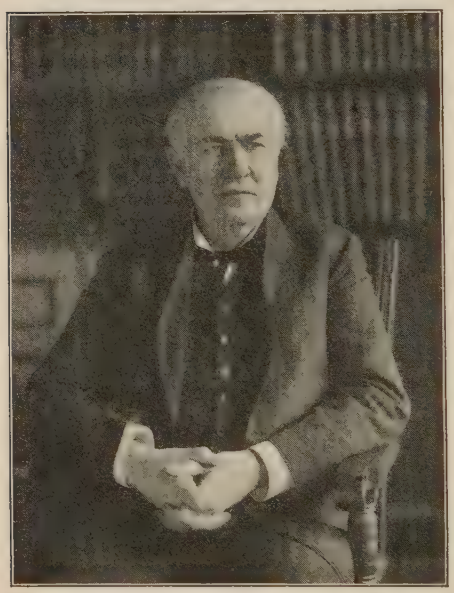
The need of reliability and expert training. From the foregoing survey of the engineering field you must surely have been impressed with the vast importance of the work and with the great variety of its forms. If the civil engineer who designs a bridge makes a mistake, his error may cost thousands of dollars and many human lives. If the metallurgical engineer errs in his judgment, the result may be the removal of a blast furnace, with its equipment, costing a half million dollars or more. Engineers, whose activities are on such a grand scale that more than any other class of workers they affect the face of Nature and her resources, must have brains and a most accurate, thoroughgoing technical education, whether they lay out railroads, design factories and their equipment, dig canals, build skyscrapers, or improve the process of making synthetic rubber.

Necessary education. If you propose to become an engineer, you should early in your high-school course consult the catalogue of the particular engineering school you are likely to enter. But to give a good idea of what subjects

you will probably need for college entrance, we have here listed those required by the Massachusetts Institute of Technology of all its entering freshmen whatever engineering course they plan to pursue: algebra A, algebra B (through quadratics and progressions), plane geometry, solid geometry, physics, French (two years), German (two years), English (three or four years), United States or ancient history (one year), and *any two* of the following elective subjects: French (third year), German (third year), Spanish (two years), Latin I (through four books of Cæsar or an equivalent), Latin II (either six orations of Cicero or six books of Virgil), English (an additional year), any college-entrance history (an additional year), chemistry, mechanical drawing (one year), mechanical drawing and mechanic arts combined (one year), or biology. These are such subjects as should be thoroughly mastered by the prospective engineer before entering his chosen engineering school. To make more emphatic the need of a thorough preparation, let us consider that while most engineering schools have four-year courses, Harvard and Columbia have six-year engineering courses, and that the Sheffield Scientific School has lengthened its course to five years. Let us further bear in mind that some engineering schools having four-year courses give such inferior training that their graduates are liable not to succeed in practicing their profession.

The cost of an engineering course. To get definite information concerning the cost of an engineering course, it is best to write to the registrar of the school you plan to enter; but to give you some idea of the cost, the following figures are presented: at the Columbia Schools of Mines, Engineering, and Chemistry, New York City, and at the Massachusetts Institute of Technology, Boston, the annual expenses for board, tuition, books, etc., but not including personal or traveling expenses, range between $500 and $1000.

If a boy has the natural qualifications for an engineer, but considers the above expense prohibitive, he may attend a coöperative course, where he spends alternate weeks in the university and in the shop. At the University of Cincinnati, Ohio, students are paid for their services in the shop just as are other employees. The wages run from 10 cents an hour, for beginners, to 19 cents for seniors. If for any reason an engineering course is preferred in a technical school which offers no shop work, with its attendant wages, there are the summer vacations in which to earn money, but one can earn little during the regular college year on account of the severity of this course. Again, after a year or two at college one can often get good pay if obliged to work for a time in order to have sufficient money with which to complete the course. Where there 's a will there are *many ways*.



A famous technical man

Mr. Edison combines rare technical ability with unusual business sagacity. His various patents fill a dozen volumes in the government patent office, yet as a general rule he devotes himself only to inventions which pay

The demand for expert engineers. The ranks of the engineering profession are not overcrowded. They are in great and increasing need of recruits of the right sort — whole-hearted manly fellows, strong in initiative, self-reliant,

resourceful, indomitably persevering, mentally broad and keen, alert, accurate, well-trained, lovers of science, of mechanics, of construction, of conservation, of progress. In a recent interview Thomas A. Edison is quoted as saying:

> We do not have enough men whose training has been such as to enable them to cope with the actual conditions of life. We do not have enough men who understand from A to Z the science of business. Most of all, we have not enough engineers. In industry and in business we need more men with engineers' training. America needs chemists, engineers, all sorts of technically educated men, because this is a new country with industries to open up and develop, and because it is a commercial country with big business to manage in the right way.

Numerous opportunities in the engineering field. Engineering, with its numerous opportunities offered in related though quite distinct departments, is an attractive profession. In this vast field one may work as civil engineer out of doors, away from civilization, or indoors as industrial chemist in the throbbing heart of civilization. While he always deals in large values, his work may be constructing a gigantic bridge, tunnel, or dam, or constructing in the laboratory a new compound of infinitesimal atoms and molecules. If you are mentally alert, trustworthy and accurate, and indomitably industrious, — if you are great enough and sufficiently well trained to work with efficiency in conserving, utilizing, increasing, or improving the resources and forces of nature, — then consider seriously some part of the vast engineering field as your life work.

EXERCISES

1. Is there in or near your town or city any long bridge, tunnel, or canal, any large dam, any high trestle, or other prominent piece of engineering? If so, find out if possible how the engineer solved the problem of the best way to construct it.

2. What civil engineer selected the route of the nearest important railroad? What were the most serious difficulties he met in building this road? What was the principal need for the road?

3. Does your own or a near-by city employ a municipal or sanitary engineer? If so, what are his duties and what is his salary? Of what engineering school is he a graduate?

4. Is there any large industry in your neighborhood that employs an industrial chemist? If so, learn from him his specific duties, and whether he has yet converted any by-product into a marketable commodity.

5. Is there any large manufacturing plant near you that employs a mechanical or an electrical engineer? If so, learn from him his specific duties. Where was he graduated? Would he advise you to enter the same profession? What subjects in your high-school course would he advise you to emphasize?

6. Are you near any valuable mines that are now being worked? Did a mining engineer discover them? Does he still direct the mining? Is a metallurgical engineer employed now in directing the preparation of the mineral for market?

7. Show the value to society of the civil engineer, the mechanical engineer, the electrical engineer, the industrial chemist, the mining engineer, and the metallurgical engineer.

8. What buildings in your neighborhood were planned by a building contractor? by an architectural engineer? Which of the two men charged more for his plans? Why were his plans worth more than the other man's?

9. What building trade is an excellent stepping stone to architectural engineering? to sanitary engineering? to electrical engineering?

10. What machine trade is an excellent preparation (on the practical side) for mechanical engineering? What technical education would also be necessary?

11. After a careful comparison of the advantages and disadvantages of them all, which one of the engineering professions appeals to you as the most desirable? Give reasons for your preference.

12. Among engineers, as among building tradesmen, there are men who have advanced to the position of contractor. If there are any engineering contractors in your neighborhood, learn what sort of contracts they take and, if possible, find out the details of some recent contract they have taken.

13. Do you think the engineering schools of the future will generally adopt the coöperative system of instruction or the part-school and part-shop system? What advantages has this part-time schooling plan over the full-time plan? (See catalogue of the University of Cincinnati Engineering School.)

READINGS AND REFERENCES

Books

GODDARD, DWIGHT. Eminent Engineers. Norman W. Henley Publishing Company, New York. $1.50.
Handbook for Chemists.[1]
Handbook for Civil Engineers.[1]
Handbook for Concrete Engineers.[1]
Handbook for Electrical Engineers.[1]
MORAN, SELBY A. Over 100 Ways to Work One's Way through College. The University Press, Ann Arbor, Mich. $1.00.
SLOANE, T. O'CONNOR. How to become a Successful Electrician. Norman W. Henley Publishing Company, New York. $1.00.
WILLIAMS, ARCHIBALD. How it is Done. Sully & Kleinteich, New York. $1.20.
WILLIAMS, ARCHIBALD. How it Works. Sully & Kleinteich, New York. $1.20.

Free Pamphlets

Announcement of the Coöperative Courses, College of Engineering, 1912–1913. University of Cincinnati, Ohio.
Booklet on "The Metropolitan Life Building," The Metropolitan Life Insurance Company, New York, and on "The Woolworth Building." The Atlantic Terra Cotta Company, Broadway, New York.
Bulletin on "Sanitary Engineering at Harvard University." Harvard University, Cambridge, Mass.
Bulletin on "Suggestions concerning the Choice of a Course in Engineering." Carnegie Institute of Technology, Pittsburgh, Pa.
Bulletin on "The Technical Opportunities of Southern California." Throop Polytechnic Institute, Pasadena, Cal.
Bulletins on "Civil Engineering," "Mechanical Engineering," "Mining Engineering," "Applied Chemistry and Architecture," "Structural and Concrete Engineering." International Correspondence Schools, Scranton, Pa.
Catalogues from engineering schools.
Photographic Reproductions of Work of Graduates, June, 1913. Rensselaer Institute of Technology.
Register of Former Students, Massachusetts Institute of Technology.

[1] International Textbook Company, Scranton, Pa. 50 cents each.

Periodicals

Architecture and Building. Monthly. William T. Comstock Company, New York. $2.00 per year.

Concrete-Cement Age. Monthly. Concrete-Cement Age Publishing Company, Detroit, Mich. $1.50 per year.

Engineering News. Weekly. Hill Publishing Company, New York. $5.00 per year.

The Engineering Magazine. Monthly. The Engineering Magazine Company, New York. $3.00 per year.

The Journal of Industrial and Engineering Chemistry. Monthly. The American Chemical Society, Easton, Pa. $6.00 per year.

Popular Mechanics Magazine. Monthly. Popular Mechanics Publishing Company, Chicago. $1.50 per year.

The Scientific American. Weekly. Munn and Company, New York. $3.00 per year.

The World's Work. Monthly. Doubleday, Page and Company, Garden City, N.Y. $3.00 per year.

CHAPTER XII

THE LEARNED PROFESSIONS AND ALLIED OCCUPATIONS

Each calling sends forth its own peculiar appeal. — MELVILLE W. FULLER

Each shall follow with cheerfulness the profession which he best understands. — HORACE

Personal services rendered by the learned professions. There is a certain body of workmen who come into closer personal relations with us than do men in other vocations. The doctor cares for the health of the body, conquers disease, and postpones death; he relieves physical suffering, and often soothes a distressed mind. The dentist cares for the teeth; but his functions are far more important than they would at first seem, for the mouth is the gateway to the body. The pharmacist, coöperating with doctor and dentist, and prescribing on his own account for a score of minor ills, is another worker for health.

But men have minds as well as bodies. The teacher takes all the intellectual, moral, and industrial wisdom that mankind has achieved and garnered during the past, and by instructing the youth of to-day enables them to start on a higher plane than their fathers did. The librarian, close to the teacher and close to the community, provides a means of continued growth for old and young alike. The journalist, quick of eye and graphic in style, mirrors the swiftly moving present on the printed page so that he who runs may read. The minister, priest, and rabbi, warm of heart, emphasize eternal values and serve as moral balance wheels. The lawyer

discerns the needs of men in relation to the complicated mechanisms of personal and property rights which they have developed, and shows how best to use this social machinery.

Such are the professional men, all of them workers and true producers. For just as a manufacturer produces a pump, as a farmer raises a bushel of wheat, these men produce that which people want — in this case, personal services.

THE PHYSICIAN

As you have seen the doctor riding about in his automobile, or charging a big price for the prescription it seemed so easy to write, the idea that medicine was the vocation of vocations may have possessed you. But do not be too hasty in your decision. There are certain qualifications which the doctor should have or failure may be his. Let us consider some of these.

Qualifications. 1. *A vigorous body.* The doctor should have a strong and vigorous physique. If his practice is large, his work is especially trying. Calls may come at any hour of the day or night, rendering his hours for meals and sleep very irregular. It is only a sturdy physique that will enable him to stand this without becoming nervous and irritable, two things which will lessen his success. The physician whose body supplies him with abounding vitality can, in spite of taxing demands, keep a clear brain and a strong personality.

2. *A cheerful temperament.* The physician should have an even temperament and a sanguine disposition. Since he is quite frequently called upon in emergencies, no uncertain disposition, no "falling all to pieces," can serve as a basis for his medical reputation. In fact, it is by his evenness of temper that he restores the confidence which upon his arrival is often sadly lacking.

No less important is his optimistic nature. The physician whose face radiates sunshine, whose step is buoyant, whose

handshake is cordial, cures by his visits quite as much as by his pills. No fact in psychology is more clearly demonstrated than that the mind influences the body. If the patient's mind, naturally melancholy and irritable during sickness, can be brought into a different state, cure is more rapid and more certain.

Young men planning to be doctors, consequently, should cultivate a habit of looking on the bright side of things. They should think good thoughts; read inspiring books; sympathize with those afflicted; and, not letting their patients' troubles cloud their own minds, they should hold firmly the sanguine view that all goes well.

They should also develop the ability to meet people easily and congenially. The student who isolates himself until he is unsocial, out of touch with men, may know medicine, but he will not win success. But the vigorous young man, adaptable and cordial, has a source of power within himself.

3. *Honesty of purpose.* Honesty of purpose is especially important to one who enters into such intimate knowledge of his patients' lives as does the doctor. It is because men's hopes are easily raised over promises of health, the sick being noted for both extreme credulity and extreme suspicion, that healing has always been a choice field for the impostor. Patent-medicine fakirs have poured tons of vile literature into mail sacks, and barrels of equally vile medicine into bottles; while various "healers" have sprung up like mushrooms, their business being about as substantial. The young doctor, of all professional men, should rest upon no mere tricks of the trade; his stand should be on the side of those who seek to elevate the medical profession by ostracizing all tricksters. Let him keep as a sacred trust what is revealed to his professional ears. Let him beware of bragging, of false claims, or of pretended cures. People in general will give him the credit which is properly his.

4. *Love for the work.* The would-be doctor should have a great love for his work. It is not enough that, when a boy, he set the cat's broken leg or liked the smell of medicine bottles. There are years of toil and sacrifice ahead of the young man who starts out to become a physician, and only an inspiring and abiding devotion to healing his fellows can keep him persistently at his task until he reaches the goal.

It is evident that these four qualities are not possessed by every boy who, struck by the ease with which some doctor sets a bone and draws a big fee, decides at once to enter medicine; but if he does possess the necessary qualifications, he may with profit consider the next step.

Preparation. Medical training has heretofore been left to medical educational authorities without adequate supervision. And as a consequence, when the Carnegie Foundation for the Advancement of Teaching made a first-hand investigation of these schools in 1909, some of its findings were surprising. For instance, the College of Physicians and Surgeons at San Francisco and the Chattanooga Medical College had only one microscope apiece. The Mississippi Medical College "did not, when visited, own a dollar's worth of apparatus of any description whatsoever." At the Eclectic Medical College of New York the entire outfit for teaching experimental physiology was kept in a little black box about as big as a safety-razor case. The outfit in pathology and bacteriology at the College of Physicians and Surgeons, Denver, consisted of an empty demijohn and some jugs.

The significant facts revealed by this study are thus stated by the Carnegie Foundation:

1. For twenty-five years past there has been an enormous overproduction of uneducated and ill trained medical practitioners. This has been in absolute disregard of the public welfare and without any serious thought of the interests of the public. Taking the United States as a whole, physicians are four or five times as numerous in proportion to population as in older countries like Germany.

2. Over-production of ill trained men is due in the main to the existence of a very large number of commercial schools sustained in many cases by advertising methods through which a mass of unprepared youth is drawn out of industrial occupations into the study of medicine.

3. The existence of many of these unnecessary and inadequate medical schools has been defended by the argument that a poor medical school is justified in the interest of the poor boy. It is clear that the poor boy has no right to go into any profession for which he is not willing to obtain adequate preparation; but the facts set forth in this report make it evident that this argument is insincere, and that the excuse which has hitherto been put forward in the name of the poor boy is in reality an argument in behalf of the poor medical school.

4. A hospital under complete educational control is as necessary to a medical school as is a laboratory of chemistry or pathology. High-grade teaching within a hospital introduces a most wholesome and beneficial influence into its routine. Trustees of hospitals, public and private, should therefore go to the limit of their authority in opening hospital wards to teaching, provided only that the universities secure sufficient funds on their side to employ as teachers men who are devoted to clinical science.

In view of these facts, progress for the future would seem to require a very much smaller number of medical schools, better equipped and better conducted than our schools now as a rule are; and the needs of the public would equally require that we have fewer physicians graduated each year, but that these should be better educated and better trained.

1. *The selection of a high-grade medical school.* This all means that to secure standing among your fellow doctors and to become able to make a success in your practice, you must attend a medical school of the first rank. Such a school will demand high entrance requirements. A common-school education once sufficed. A high-school course is now the minimum, while the best schools are requiring two years of college work for entrance. And it may be that after a few years college graduation will be necessary before medical studies can be commenced.

The course itself has been made more difficult, and requires four years of hard work. And since it calls for expensive equipment, the tuition is high. The laboratory work, in addition to the lectures, so fully occupies the time of a

conscientious student that he cannot expect to earn much toward paying his expenses by doing outside work. Send for a catalogue of some first-rank medical school, and look through its entrance requirements, its tuition fees, its course of study, the living expenses which must be met, in addition, and estimate what this medical education will cost you in time and money.

2. *Graduate work required of the specialist.* Bear in mind, however, that this training equips one only for service as a general practitioner. In order to enter what is becoming an increasingly desirable field, that of specialist, one needs additional training in his particular subject, be this the eye, stomach, or the lungs; and this training calls for post-graduate work either in some American or foreign city noted for medical study. It is needless to say that such training is expenisve.

3. *Necessity of hospital experience.* But the cherished degree (Doctor of Medicine) once secured, your struggles are by no means over. It takes practice to make perfect. And a very good way to get this is to serve without pay as interne in a hospital. "Every conscientious physician procures a hospital diploma before going out into the world," says Dr. Shrady, former editor of the *Medical Record*; "and he learns more in that last year than he has learned in all his previous term of study." But this hospital experience completed, at last the time comes for hanging out the shingle.

4. *Location.* Upon a wise choice of location depends much of the doctor's financial success. In a community where the people are inclined to call little for medical services, or where several doctors are already strongly intrenched, he may find it hard indeed to meet expenses. And in his home community he is liable to lack prestige, for people knew him when he knew no medicine, and many are ready to doubt that he knows much now.

Habits of work. Medicine does not stand still, but is a rapidly changing science. "Probably no one of the professions," says Dr. Roosa of the New York Post Graduate Medical School, "has made more progress in the nineteenth century, and stands in a more advanced position at the opening of the twentieth, than that of medicine. The invention of general anæsthesia by ether and afterward by chloroform; of local anæsthesia by cocaine; the determination of the cause of suppuration in wounds leading to antiseptic surgery, with all its possibilities of cure by surgical operations of what was before incurable; the discoveries in the laboratory of the origin of disease, and the toxines with which to combat it; the invention of various instruments to examine the hidden parts of the body, as well as a new source of light by which even the skeleton is plainly seen, with numerous other advances, open a great field for him who is properly fitted to enter upon the practice of medicine and surgery."

This means that the doctor must be always a student. He must keep abreast of medical improvements by reading professional periodicals and the latest textbooks. He must be eager to learn of new cures and new instruments. If his practice is in a country town, he should take a post-graduate course every few years, and come to the great city with mind as open as if to learn anew his profession. Unless he does these things he will be left years behind the times, and his patients will be lost to some young medical graduate.

The successful practitioner is increasingly busy, and must not look forward to long vacations. He will do well to make his expenses for the first year or two, and hence cannot afford vacations. Again, it is when the older doctor is away that people may be compelled to seek him out, and once called he may be retained as the regular physician.

Remuneration. The young man may wonder what are to be his financial returns for such earnest efforts. The physician usually has no stated salary. Much depends, of course,

upon his location and professional ability; something depends, too, upon his business ability — high scientific attainments do not seem to be often combined with shrewd business sense; some secure fees into the thousands, some scarcely any fees at all; but in general, their incomes enable them to live comfortably.

Most revolutionary of all are the changes taking place in our conceptions of medicine. It is said that the Chinese pay their doctors when the patients are well and stop this pay as soon as they are sick. To-day the emphasis is placed everywhere on the prevention of disease rather than on its cure. While this may seem a simple view, the germ theory of disease indicates that in order to prevent disease, the general living conditions of a community must be improved. For example, see how preventive medicine operates in attacking typhoid fever. The older plan was to attend to the sick individual; the present plan is to attend to the water supply, food supply, etc., so that the individual will not get sick.

The physician is thus becoming a public servant. He works not only to get disease out of the person, but also, if it be communicable, to drive it from the community. No one urges upon the public the menace of the town dump or the unfiltered water supply more earnestly than he. This knowledge he lays before the people in addresses, articles in the papers, or in conversation upon the streets and in the homes. He makes known his investigations to his medical society in an address or writes an article for the medical journal. His reports to the board of health supply the public with a vast amount of free information. In all these ways the physician is not simply a carrier of prescription pad, drug case, and fee book, but a storehouse of valuable information which is being offered at every turn in the community service.

But see what this means when fees are considered. The doctor is paid by the sick person whom he treats, and most

people would be shocked to receive a bill for medical services when they had been well all the year. Thus by preventive activity the doctor cuts off his own income. Still, there is no doubt that preventive medicine will keep on growing in importance, and that this view of disease as something which society as a whole must struggle against will increasingly mean that much of the physician's services will go unpaid.

Social service. Such a conception of the physician's work indicates that without doubt it is a noble calling. "Every physician," says Dr. Starke, "is anxious to impart the best that he knows and put everybody on the road of right living, prevent disease, and advise the sick regarding their health. This he does, not only because you send for him, nor because you hold out a fee to him, but because he would not have taken the profession for a livelihood if he did not love the work in spite of its hardships and the study without end, but for the love of his fellow man and the desire to do good and relieve human suffering. Hippocrates said, 'He who loves his art loves man.'"

THE DENTIST

Dentistry is another profession which is making great advances, these being perhaps even more rapid than in medicine.

Advantages and disadvantages. Its advantages over other professional vocations are few, the remuneration, office hours, and the class of people with whom one comes in contact, averaging about the same. But dentistry possesses at least one distinctive advantage, namely, contributing to the education of the public in the care of the mouth, the necessity of proper mastication, correct occlusion of the teeth, and the right way to care for them.

To some of you this may not seem a large enough work to which to dedicate your life, but if you will consider

that more than eighty per cent of the people do not use a toothbrush, never consult a dentist except for extractions, you will appreciate what overcoming the decay of the teeth means to the health of the people. Also think how an unclean mouth pollutes the air in a crowded place and how much illness and suffering it may cause. In rendering dental service one benefits mankind in a most praiseworthy way.

Its disadvantages lie mostly in the nervous strain to which the practitioner is constantly subjected, the unclean mouths and bad breaths he frequently has before him, and, as in all professions, the years it takes to build up a paying practice. The cost of fitting up a dental office is also a serious item to the average young graduate.

Remuneration and advancement. After graduation there are two ways of proceeding: starting for one's self or working as assistant. In the first case you have for some time the problem of paying expenses, which is a long struggle for those who have but little financial backing, and hard enough for those who have considerable money ahead.

In working as assistant you can generally start at a salary of twenty-five dollars a week and a commission on all the work you do, and advance to as large a salary and commission as you are able to command, depending entirely on your speed and the quality of your work. In working as assistant, you are gaining much needed experience both in dentistry and in the management of an office.

After one has finally become established in his own practice, his earnings will depend on several things: mainly the quality of his work, his personality, the appearance of the office, and the place where he locates. But a good man should be able to make two or three thousand dollars a year and from that up. The National Dental Association has estimated that two thousand persons should support one dentist, and since there are only about fifteen thousand dentists in the country to-day, it is clear that when

the public is educated to dentistry — which profession is as yet in its infancy — there will be need of at least thirty thousand more practitioners.

The average professional career of a dentist is about thirty years, but this depends on the care he gives himself. The nature of his work demands that he take plenty of outdoor exercise, and as he yields or does not yield to this demand will his period of usefulness be lengthened or shortened. It takes a young dentist about five years to get well started and then, if he has shown himself to be a good man, his rise is rapid.

Qualifications and training. The natural qualifications demanded of a man entering dentistry are thoroughness, neatness, pleasing personality and appearance, and a mechanical turn of mind. Those to be desired are a conscience (as the chances for deceit and chicanery are many, since patients are usually ignorant of what is being done) and an æsthetic sense to help in reproducing nature as far as possible.

The usual dental course is three years in length. As in the case of medicine, there is at present a strong movement to raise the requirement for admission and the grade of instruction offered in dental schools. Students interested in this vocation should consult catalogues of leading schools of dentistry.

THE PHARMACIST

Qualifications and training. It is not so difficult to enter pharmacy as either medicine or dentistry. The requirements differ somewhat in the various states, but usually two years of eight or nine months study suffice. Admission to a school of pharmacy requires nothing beyond a four-year high-school course, less being often sufficient. Tuition is from $100 to $150 per year. The amount required for living expenses depends naturally upon where the school is located and upon the individual student.

A young man who thinks of pharmacy as a career should be accurate: his work will include the handling of dangerous drugs, where a mistake may be fatal. He should also be of sterling character; for he will dispense alcoholic liquors and narcotics, and must be able to withstand constant temptation. He should be interested in the activities of his vocation — the mixing of drugs, the solving of problems in chemistry, the meeting of people, etc. As a start before taking up his pharmacy course he would do well to work in some local drug store for a time. In New York State, for instance, no matter from what school a man may be graduated, he cannot be registered until he has two years of practical experience.

In this way he will be proceeding on definite ground when he enters upon his regular pharmaceutical course, and his previous experience may help him to secure a position in a drug store, and thus to pay part of his expenses while attending school. When, as in some courses of study, only three days' attendance per week is required, and a term of eight months leaves a long summer vacation, considerable spare time is available for work outside.

Nature of the work; remuneration and advancement. The young graduate in pharmacy does not, like the doctor or dentist, depend upon fees, but has a regular salary and is able at once to earn a living. Before securing his license he often receives from $8 to $12 per week, and after finishing his course and passing the state board examinations, he should receive as high as $18 to $25 per week.

The school of pharmacy prepares a young man especially for work behind the prescription case. Some young men prefer this, and secure positions where filling prescriptions is the only work they are required to do. But there is also much to do as a salesman, the returns from prescriptions in many drug stores being only a very small part of the trade. The young druggist therefore should develop his

ability as a salesman. He should know something about the soda fountain, the candy trade, patent medicines, cigars, and often paints and oils and stock food. In short, he should become a good business man.

A man who thus pushes the drug business in whatever departments are most profitable to his proprietor can advance with fair rapidity until he earns from $30 to $35 per week. But he will also come to the point where he can do better in a store of his own.

The hours are usually long, the work confining and, to some, unhealthful. But the pharmacist occupies a good social position in the community, and has an excellent opportunity to establish a store of his own. Should he desire to become a physician or a manufacturing chemist, his knowledge of pharmacy will be of value.

EXERCISES

1. What are the duties of a school physician? a school nurse? a school dentist?

2. What can you tell of the work of the medical missionary? the sanitary engineer?

3. Who is your local health officer or commissioner? What are his duties?

4. Interview some local dentist concerning his vocation, and report to the class.

5. Have you any friends who are pharmacists? If so, what have they to tell you of their work?

6. How many hours on week days is your local drug store open? How many hours on Sunday?

7. Of what importance is health? It is said that medical science has lengthened the average life fifteen years. Discuss the meaning and value of this.

THE TEACHER

Education an important field of work. Education is another field in which considerable progress is being made. It is likewise one where clear thinkers and great leaders are needed. At the tap of the public-school bell every morning over twelve million pupils assemble to be taught. In the ten years ending 1910 the number of public high-school pupils increased 76 per cent. In 1910 the number of teachers employed in these high schools was 41,000, and the total number in public-school service was over half a million. "Never have the people," says the United States Commissioner of Education, "shown more clearly their interest and faith in education and in schools of all kinds and grades."

Do you think that it makes much difference to us as individuals and as a nation what sort of teachers and instructors we give to our young people? Do you know that, next to your parents, your teachers have done most for you in shaping your habits of thought and speech, your behavior, your life ambitions and ideals, in short, your very lives? Do you realize that our schools are taking young foreigners from every walk in life, and that from this material, some of it very unpromising, they are making substantial American citizens? Again, do you appreciate the fact that our schools add vastly more to our nation's prosperity and stability than our army and navy combined? It may be that some of you desire to have a part in this field of educational service, and hence are interested to learn about teaching as a vocation.

Wide range of positions and salaries. Since teaching positions range all the way from rural-school work at $30 per month to city superintendencies and university presidencies at $10,000 a year, it is evident that an equally wide range of preparation is required. In general no public fund

can be paid teachers whose qualifications have not been favorably passed upon. This means that usually an examination is required of the prospective teacher at the office of the county superintendent of schools, the city superintendent, or the state superintendent, the scope of the examination depending upon the position sought, the qualifications of the applicant, and the laws of the particular state. Information regarding qualifications and approximate salaries in any particular state can be received from the State Superintendent of Public Instruction.

Positions in rural and graded schools. To receive certificates for teaching in ungraded rural schools, there is required a thorough knowledge of the common branches, a high-school education and, in addition, at least a summer-school course or a year of normal training. To teach in the grades of city schools, as well as in an increasingly large number of rural schools, one must have completed an entire normal-school course of two or three years' length. Salaries in rural positions and graded schools of village and city range from $30 to $80 a month for room teachers and from $50 to $150 for principals of buildings. Of course, in the larger cities the salaries are considerably higher.

High-school positions. In order to secure positions in public high schools or private preparatory schools, it is as a rule necessary to complete a four-year college course, although in some sections a normal-school course is accepted. As we all know, the normal school is a professional training school for teachers, offering instruction in education — its history, theories, practices, and methods of teaching. Likewise, in a large number of colleges to-day there are found similar courses in education to help equip students for the teaching profession. The salaries of high-school men vary considerably. In the small schools of some sections $50 per month is not uncommon, while in larger places and especially in the East and the far West men may receive

from $75 to $120 per month and upwards. If one advances until he becomes head of a department in a large high school, he may receive as high as $2500 or $3000 a year.

Special teachers. There are certain changes going on in public education which are most noticeable in the new subjects of the later courses of study. Whatever subjects are uppermost in the minds of the people in general will sooner or later be taught in their schools. People are to-day more interested in commercial, industrial, and agricultural subjects than in Latin and Greek, hence there is a greater demand for teachers of the former subjects than of the latter. In teaching, as elsewhere, it is wise to take advantage of the popular trend and to prepare yourself for the service most in demand. Among the special lines of teaching in vogue to-day the following are perhaps most worthy of your attention:

1. *Commercial teacher.* Boards of education will pay better salaries to young men teaching commercial subjects than to those teaching academic subjects because men so qualified are more difficult to get, and therefore their services at present are of more value. To secure such a position one should complete the high-school course, get all the practical experience possible during vacations, and attend some high-grade business school with a normal department or a school of commerce, preferably one located in a great commercial city.

2. *Supervisors of penmanship, singing, drawing, etc.* Closely allied to the commercial teacher is the teacher and supervisor of penmanship. He should have about the same educational training, but should also be an expert penman, able both to teach penmanship and to supervise others teaching it. Occupying similar positions in public schools are the teachers and supervisors of singing, drawing, and physical culture. These all teach their one branch, and have had special training for their work besides the education received in high school and often in normal school as well.

3. *Industrial teacher.* There is a widespread demand for industrial training. It is pointed out that while the usual education fits students very well for entrance to college, preparatory to a professional course, still the majority of our students never enter the professions. And it is rightly insisted that the schools should train pupils for actual, not imaginary, careers. But when it comes to preparing young men for the trades, it is found, for instance, that the ordinary teachers do not know carpentry, and the ordinary carpenters do not know teaching. Hence there is a steadily growing demand for the industrial teacher, one who both knows a trade and can teach it.

4. *Teachers of agriculture and manual training.* Closely related to the industrial teacher are the teacher of agriculture, whose work was treated in Chapter IV, and the manual-training teacher, who instructs boys in woodworking. These three special instructors require about the same preparation as the regular teacher, with the addition of special training in their particular branches.

5. *Vocational counselor.* Schools in a certain sense are like factories turning out a product, in this case splendid young graduates. But factory products are worthless unless people can use them, and school "products" are useless unless they can do things. Is it not clear then that the real test of whether the high school does good work is found in what its graduates have proved their ability to do, the success they have achieved five, ten, or fifteen years after leaving school? This means that the schools are coming to a new point of view; that they recognize it as their business to be interested in the practical means by which their graduates make good; in short, that since it is in life work well done that the test really comes, the school must study the community occupations and the individual students, and seek to fit each student into the vocation in which his work will be most effective. This is the work

of the vocational counselor, an educational worker who is as yet but little known outside of a few large cities.

The teacher who gives this course can explain fully how to become a vocational counselor. The counselor's main activities are as follows: He investigates the occupations of the city, and sends students out to get vocational information. On the one hand, he learns what opportunities of life work the community has to offer, and, on the other, he studies boys and asks them a series of searching questions. He gives them some matter-of-fact advice, some of which may at times cut into their pride, but he helps them to become more effective young men. Hence his work in a community means a more purposeful education and a more successful living.

College positions. 1. *Education required.* To many, a more desirable position than any of the foregoing would be one in a college or a university. In order to secure such, it is necessary to complete the college course and, in addition, from one to three years of graduate work. Young men deciding to become college teachers should select the particular study or department in which they are most interested, and then take all the courses offered in this during their four years at college, giving attention also to closely allied courses. For instance, the prospective instructor in English literature should devote considerable attention to English history rather than to mathematics, physics, or chemistry.

He should then — or better, after teaching his specialty in high school or academy for a year or two — study at one of the really great universities where men of international reputation give courses in his specialty. At the end of one year he may secure the Master of Arts degree, and at the end of three years the degree of Doctor of Philosophy. In order to secure a position in the best colleges and universities, three years' graduate study is usually required.

2. *Remuneration.* The salary at which a young man starts as instructor may be anywhere from $500 to $1200 per year,

with a possible annual increase of $100. A man of ability finds it difficult to advance faster than the average, and it is a common practice for such to secure better positions in other colleges. It usually requires a number of years for the young instructor to work up to be a full professor, when his salary would be from $1500 to $5000, depending upon whether he is in some weak college or a first-rank university.

Supervising officers. Some men have the ability to direct others, and are especially fitted for executive work. There are in the field of teaching numerous positions for such men, places in which executive ability of a high degree may be used to advantage. These include supervising a high school (the work of the high-school principal); the management of a city school system (the work of a city superintendent); the supervision of the schools in a county and a state (done by the county superintendent and the state superintendent respectively); the direction of a normal school, college, or university (the executive officer being called a principal, president, or chancellor).

These are all positions of honorable service, and provide much better salaries than the usual teacher's work. Nor is the work to one of proper temperament and qualifications a greater strain than that borne by the average teacher.

Daily work of the teacher. While it is commonly supposed that teaching is easy work, this is a mistake. The hours seem to be short and the vacations long, but teachers have often complained that their work is hard, and investigation has revealed that this complaint is based on fact. Our advice to those expecting to teach because they are not strong enough to do anything else is, Don't. They should secure a copy of Lewis M. Terman's book "The Teacher's Health" and discover the reason.

Teaching as a stepping stone. For generations many young men have used teaching as a stepping stone. This can be done if one is able to secure a position teaching the

proper subjects for the desired promotion. For instance, a young man planning to become an industrial chemist might find a distinct advantage in teaching high-school chemistry. Or if he planned to become a physical director, he might do well to direct high-school athletics and to teach physiology and hygiene. Or if he were looking for a business opening, work at the head of the commercial department might prove highly desirable. Or should he plan to be a newspaper man, he could teach English composition and rhetoric and do reporting after hours.

Cautions. The caution must be given, however, that in using teaching as a stepping stone, one should not lose sight of the larger ambition. Too many have drifted into teaching as a temporary occupation and have continued in it for life. If your ideal is elsewhere, guard against this danger and move forward. Again, the young man who goes into teaching simply for the money he can get out of it will very likely be disappointed. For teaching, like the work of the minister, priest, or rabbi, is profitable not so much in dollars and cents as in the satisfaction derived from serving mankind well and from doing much civic and individual good in the world.

THE LIBRARIAN

Natural qualifications demanded. You may have an idea that library work is only for women and bookworms. Yet, as the New York State Library School points out, "There are few lines of work in which more varied ability is desirable. A high degree of executive ability is demanded for the administration of a large library, with its many different lines of activity. Business judgment is necessary to make a limited income supply increasing needs in books, periodicals, and service. Literary skill is needed to determine what reading matter should be purchased to serve best the needs of the library's patrons. Much technical skill is needed in

cataloguing and bibliographic work. Intimate knowledge of books and an equally intimate knowledge of human nature are essential for reference work."

Nature of the service rendered. "By strengthening and supplementing the school course, by promoting local industries through furnishing the best technical literature relating to these industries, as well as in furnishing reading for culture and recreation, the library may become a civic center and a real social force. In few other lines of work is it so essential to be thoroughly up-to-date and in touch with the life of the community, for no one can make books do their full service who is not in sympathy with the real life they interpret. Scholastic seclusion is no longer possible in an efficient library except in very special lines of bibliographic or clerical work."

Preparation. This is a sort of work which calls for worthy young men; and if you are scholarly and bookish in your tastes, it will very likely prove enjoyable. A good way to begin library work is while in high school to become familiar with the library equipment at hand. Learn to use the card catalogue intelligently, and become acquainted with the magazine indexes, such as the "Readers' Guide to Periodical Literature." Make use of such works of reference as the "World Almanac," the "Statesman's Year Book," the Statistical Abstract, and various encyclopedias. It would be excellent practice to work up a bibliography covering the material in the library which bears upon some assigned topic.

It will be possible to enter a library school after completing the high-school course, but a college course is of decided advantage, and necessary for securing better positions later on. You will find wide reading essential and a knowledge of several languages most advantageous, since the successful librarian must be on familiar terms with all great literature of every kind. First-grade library schools are not numerous, but if properly prepared you can graduate from the best one in two years. Send for catalogues and investigate the courses.

Remuneration. Graduated from the library school, you are practically certain of a position. The salary at the start is from $900 to $1000 a year. The tenure of office is usually secure and the chances of advancement are good. A young man of suitable natural qualifications and professional education can reasonably expect to receive a salary of from $2000 to $3000, and occupy a desirable position socially.

THE JOURNALIST

Advantages and disadvantages. The career of the journalist offers several special advantages: it keeps one in touch with events of the day; it affords the opportunity to meet leading men and women; it permits considerable freedom of movement and provides many interesting experiences; it furnishes opportunity for self-expression, a most basic form of human enjoyment; and it allows one to oppose evil and advocate good things for the benefit of mankind.

But there are also disadvantages to be considered. None but quick, accurate thinkers can keep up with the day's happenings. Before the dull thinker will have heard the first rumor, his competitor will have a full column on the front page. None but men of good manners and some refinement can secure news from leading men and women; certainly the semi-detective boor cannot interview the notable nor be assigned to follow the presidential candidate. Freedom of movement and interesting experiences usually mean irregularity of meals and sleep — a strain which to be withstood demands a strong physique. The write-up requires literary ability, and when good work has to be done at high speed this ability needs to be of a special quality. Opposing evil and upholding good means making enemies. This to some men is a severe nervous stress, which when added to the other strains of newspaper work demands strong will power, perseverance, and something of the fighter's temperament.

Starting points for the beginner. There are various kinds of work in journalism. Young men who are fond of sports may develop into editors of the sporting page; others are bookish, and may write principally book reviews; still others are absorbed in art, or the drama, or music, or society, or crime and the courts. Men who can do good work in more than one branch of journalism will have little difficulty in securing employment, while on the other hand they will probably find it hard to advance to a well-paid position. In general, the ranks are crowded, and it is not unusual for even a well-qualified young journalist to be out of work or at least unable to make adequate living expenses.

It is not hard to get the opportunity to try yourself out in newspaper work. Take hold of the high-school paper or annual, or write up news items for the local editor. He may take whatever items you are able to hand in. A very successful journalist of our acquaintance early in his senior year at college asked an editor if he might not do reporting for him, and before graduation was earning on this part-time basis several dollars per week.

The best training. If the work appears to offer a career in which you can succeed, make definite preparation for it. Attend a college which offers a strong course in journalism. These colleges at present are very few in number, but they have already demonstrated their value.

Talcott Williams, Director of the School of Journalism, Columbia University, writes:

> For thirty-five years journalists have watched the successive attempts to provide courses in newspaper work and establish professional training for journalism, in grave doubt whether the same measure of preparation could be provided for a calling which is at bottom an art, as is furnished for callings like law and medicine, which are at bottom professions. The difference is clear. An art cannot be imparted without actual practice in it. In a profession the principles, knowledge, and method can be successfully imparted and the practice can come later. "There is no way of learning to report, but to report," has been the conviction of nearly every

journalist who has been a reporter and remained a reporter, as every journalist should, to the end of his days.

Work in a school cannot and does not turn a man into a journalist. A law school does not make a lawyer. A school of medicine does not make a physician. But every newspaper man who has trodden the hard and sterile path of the city room in undergoing his training, can judge for himself the value of this practical work in bringing a man to the newspaper office, ready for his tasks, knowing how to avoid mistakes and knowing, too, how to obey the orders of his superiors and do the assignments on which they send him.

Remuneration. The average "cub" reporter gets a small wage, usually from $8 to $10 per week. He should be well satisfied if he receives $10 to $20 per week. How high he will climb eventually depends chiefly upon ability and somewhat, of course, upon opportunity. Walter H. Page, editor of the *World's Work*, is said to receive $35,000 a year, Arthur Brisbane, $52,000, and it is reported that Frank Munsey offered Theodore Roosevelt $100,000 a year if he would edit the former's New York daily. It is safe to say, however, that a man in the prime of life who receives from $2000 to $2500 a year may be ranked as a successful journalist.

THE MINISTER, PRIEST, OR RABBI

The life-calling of the religious leader is a noble one, no matter what particular religion or denomination is served. Hence, although in public high schools no particular faith may be taught, it is believed that not to give some place to this calling in a book of life careers would be a serious omission. So, while we shall merely touch upon some of the general features of this vocation, we would advise the boy who is thinking seriously of entering this calling to talk the matter over with his parents, and then get from his pastor whatever additional information is desired.

Kind of service rendered. The religious leader is one of the great educational and inspirational forces in the life of

men. He has to do with the enrichment of human life, with the purification of the fountains of action, with the uprooting of the evils which afflict mankind, and with lessening and destroying the sorrows of the world. It takes men of as good caliber to make successful ministers, priests, and rabbis as it does to make successful bankers or other business men. Young men of good intellect, clean heart, and some wealth should ask themselves in all earnestness whether they are not called to devote their lives, their great gifts, and their money to the service of mankind.

Education and remuneration. As is well known, prospective religious leaders should obtain all the education that high school, college, and seminary can offer. Their pastoral work later on will include constant study of the highest themes, close contact with all classes of people, and countless opportunities to help others and to uplift society. Consequently they should be of keen intellect and studious, morally sound, lovers of their kind, high-minded, with their ambitions set on spiritual values rather than on material success. While this vocation is totally unlike most others in compensation, and the young man looking for the material rewards of life will hardly be tempted to join this company, still, he who possesses the sublime ambition to spend himself in noble deeds, with little thought of self, will not be without an adequate reward.

THE LAWYER

After having heard some eloquent advocate make his plea before the jury, you may have become fired with the ambition to be a lawyer. There is indeed a certain fascination in the practice of law. Its reasoning is keen and logical, its activities are in vital contact with men of affairs, and it furnishes the never-failing study of human nature, the fierce joy of forensic battle, and the opportunity to participate in public affairs. The law, too, is of personal

service to a man, since he learns what his rights are and how to defend them. It is also of commercial value, a splendid adjunct to the real-estate dealer, collector, banker, or manufacturer.

An overcrowded profession. But the law is a very much overcrowded profession. In Chicago about 1000 lawyers have a fair practice, while some 4000 others are trying all sorts of plans to make a living. In New York City alone there are more lawyers than in the whole of Germany or of France. But in Chicago, New York, and other American cities only a small proportion of these men are really lawyers in practice; most of them eke out a living in selling insurance, dealing in real estate, reporting for papers, doing hack work for busy lawyers, or watching with hungry eyes for political jobs. Such activities do not constitute a desirable life career. And since so many young lawyers are forced to do these things, you should think seriously before entering law.

Personal qualifications demanded. Before you choose a vocation in which thousands of young men are not succeeding, you should ask yourself, Am I especially well equipped to push past these men and make good in law? This means, for one thing, are you strong-willed, able to resist temptations, and keep your record honest? No tricksters can make a success in law, which has its temptations that no weakling of a man is able to withstand and keep honest. It means, too, are you aggressive? For in law there is something of the fight, of the rough-and-tumble in which a man must keep cool, set his jaw, smile calmly, and deliver body blows.

With this aggressiveness is needed keenness, a knowledge of when to strike. And to keenness should be added studiousness, the analytic mind, and the student zeal which, because they bring their possessor to the courtroom thoroughly prepared, win the case before the first juror is drawn. Add

to these an intense devotion to the law, the high resolve that in it he shall live and for it he would die, and it may be claimed that the young man is well equipped to prepare for law.

Training and getting started. To *prepare* for law — not to enter law, for this is years ahead — a high-school education is required as a preliminary, and should be followed by a college course. The lawyer must be a well-informed man in general, for in a lawsuit there is no estimating what he may be called upon to know. "The law reaches in every direction," says the late Justice Brewer, "touching every branch of knowledge and life. Every increase in civilization, making as it does the social and business life more complex, increases the demands for a larger storehouse of knowledge on the part of the lawyer."

As a result of this growing complexity of legal practice, lawyers are specializing quite the same as engineers, teachers, or physicians. Some devote themselves exclusively to criminal cases, others to civil cases, and still others to the law of corporations, trademarks, patents, or property titles.

Most of the famous lawyers of the past studied law in the offices of established attorneys, but it is recognized that the proper training for the legal profession to-day is gained by attending, after graduation from college, a law school whose course is usually three years in length. Upon completing this course the young man takes the state bar examination, and if successful he is admitted to practice in that state.

The young lawyer is then ready to open an office or to become an assistant in some well-established law firm. This latter plan, if it can be arranged, is perhaps to be recommended. In either case, it is not uncommon for young lawyers to wait two, three, five, or even more years before they earn expenses.

EXERCISES

1. Have any of your friends or relatives become teachers? librarians? journalists? ministers? lawyers? What can you tell of their careers?

2. Interview some man in each of the above professions and report to the class what you have learned concerning his life work.

3. Secure a catalogue of some first-grade school preparing students for a profession which interests you, and tell the class something of what the course is like.

FOR THOSE WHO THINK OF BECOMING PROFESSIONAL MEN

Overcrowding in the learned professions. The learned professions, it would seem, in general are overcrowded. Men often spend long years in preparation and in the end lead mediocre lives when the same effort would have brought them success in some other occupation. What causes this overcrowding? One reason, no doubt, is the prevailing system of education which fits students for the professions rather than for anything else. The young man at the end of his high-school course and of his college course, too, often seems rather out of touch with practical affairs and, feeling himself above the work offered him but keen as a student, drifts into law, medicine, or the ministry, or takes up teaching as a makeshift.

This statement is in no way intended as a criticism of those young men who early decide on a certain profession and resolutely push toward it year after year. Such earnest persons are an inspiration, and for them it is true that there is always room at the top. But many young men drift on in their studies year by year because it would take energy to stop. For these, "room at the top" is a dream; their days will be spent among the many at the bottom.

Qualifications for entering the learned professions. If you are especially well fitted for a profession and able to make the preparation necessary, and if your heart yearns for this

profession and this only, go into it by all means. Push forward and keep on pushing, for you are reasonably sure to win. But do not let some good examination marks or quickness in learning lessons inveigle you into a profession never meant for you; and do not imagine that winning the high-school debate proves your fitness for a lawyer's career. Such qualities may also fit one for a book agent. But in any case, whether it be medicine, farming, or blacksmithing, take a positive attitude toward it. Do not drift, or you may be caught in some undesirable eddy. Choose the vocation in which you believe your greatest success will be found, and then pursue the education which best prepares you for that career.

READINGS AND REFERENCES

Books[1]

Bardeen, C. W. Teaching as a Business. C. W. Bardeen, Syracuse, N.Y., 1897. 50 cents.

Bleyer, W. G. Newspaper Writing and Editing. Houghton Mifflin Company, Boston, 1913.

Bostwick, A. L. The American Public Library. D. Appleton and Company, New York, 1910. $1.50.

Campbell, John. Lives of the Chancellors. Thompson Company. $5.00.

Campbell, John. Lives of the Chief Justices. Thompson Company. $5.00.

Given, J. L. The Making of a Newspaper. Henry Holt and Company, New York. $1.50.

Harrington, H. F., and Frankenberg, T. T. Essentials of Journalism. Ginn and Company, Boston, 1912. $1.75.

Larned, J. N. Books, Culture, and Character. Houghton Mifflin Company, Boston, 1906. $1.00.

Lincoln, Lillian J. Everyday Pedagogy. Ginn and Company, Boston, 1915. $1.00.

Olin, Charles H. Journalism. Penn Publishing Company, Philadelphia, 1910. 50 cents.

Perry, Jr., Arthur C. The Management of a City School. The Macmillan Company, New York, 1908. $1.25.

[1] For books on commercial law, see p. 96.

RALPH, JULIAN. The Making of a Journalist. Harper and Brothers, New York, 1903. $1.25.

SLOSSON, E. E. Great American Universities. The Macmillan Company, New York, 1910. $2.50.

TERMAN, LEWIS M. The Teacher's Health. Houghton Mifflin Company, Boston, 1913. 60 cents.

PAMPHLETS

Addresses and Proceedings of the National Education Association. Annual.

Librarianship as a Profession. New York State Library School, Albany, 1911. Free.

Medical Education in the United States and Canada. Carnegie Foundation for the Advancement of Teaching, New York, 1910.

Report of the Commissioners of Education. Annual. Washington, D.C.

Training for Librarianship. American Library Association Publishing Board, Chicago. 10 cents.

PERIODICALS

Educational Review. Monthly. Educational Review Publishing Company, New York. $3.00 per year.

Journal of Education. Weekly. Boston. $2.50 per year.

Popular Educator. Monthly. Educational Publishing Company, Boston. $1.50 per year.

Public Libraries. Library Bureau, 156 Wabash Avenue, Chicago. $1.00.

The American Journal of Pharmacy. Monthly. Philadelphia. $3.00 per annum.

The Dental Register. Monthly. Samuel A. Crocker Company, Cincinnati, Ohio. $1.00 per year.

The Editor and Publisher and Journalist. Weekly. Editor and Publisher Company, New York. $2.00 per year.

The Library Journal. R. R. Bowker Company, 298 Broadway, New York. $4.00.

The School Review. Monthly. The University of Chicago Press, Chicago. $1.50 per year.

CHAPTER XIII

MISCELLANEOUS AND NEW OPENINGS

The great things have not all been done; scarcely have they been commenced. If you have greatness in you, do not be discouraged. It is up to you. — A. J. BEVERIDGE

Old men often marvel at how different things are now from what they used to be. Your fathers can point out many changes since they were boys. This world is, in truth, changing all the time, and you yourselves are in the midst of it.

But to young men interested in life-careers these changes have an added meaning, and are to be taken advantage of. If you were on a gridiron and saw your opponent with the ball under his arm making a quick swerve toward the other side of the field, would you not rush to station yourself where you could lay hold of him? Do the same with your life career. If a splendid new line of work with good positions comes in sight, keep your eye on it and make a "fierce tackle." This may save you the disappointment of saying "I wish I had only thought about that," and it may mean to you a good start on the road to success before others have realized that there is even an opening.

A number of miscellaneous and new openings will be presented rather briefly in this chapter, the last in which specific vocations are treated. Most of these occupations may interest you only as a matter of general information; but there may be one which will stir the life-career motive in you. If so, use the exercises, readings, and references to find out much more about this life calling than we have space to present.

THE PHYSICAL DIRECTOR

The world's work demands energy, aggressiveness, and persistence. To win to-day requires red blood, a sound body, and a sound mind. What is needed is not a few highly trained acrobats or athletes but many men with an all-round development. In other words, physical education for most men should not be made an end in itself, but only a means toward wholesome habits, bodily vigor, sound judgment, keen mind, efficiency in daily work. And it is because of this, and not the competitive element, that physical education rests upon a sound basis.

The work of the physical director. The really valuable service rendered by the physical director, consequently, is in such work as (1) giving physical examinations at the beginning of a course and mapping out appropriate exercises; (2) repeating these examinations from time to time and seeking to make the work most helpful to each member of the class; (3) conducting classes on the gymnasium floor, planning games in which all take part, teaching swimming, etc.; (4) counseling those who need advice on problems of purity and moral strength. One of the greatest forces we have ever known for the uplifting of young men was the physical director of a high school in a town of 30,000 population. Keen critic, kindly "father," he went about doing untold good.

Another phase of the physical director's work is supervising playgrounds. The truth is being impressed upon people that children must be taught how to play, since in this there are great educative possibilities. All of our large cities now have organized playgrounds, and the time is not far distant when these will be found in every city or village of 5000 or more population. This will mean an increasing demand for playground directors. It will also mean that many who serve as high-school directors during the school year will have the opportunity to take charge of playgrounds during the summer.

Personal qualifications. In order to make a success of this work a young man should have, first, a healthy, alert, vigorous body. Physical imperfections are a decided hindrance; a good physique with abounding vitality augurs success. His morals should not be merely negative, innocent of wrong, but positive, a tower of strength. The slightest taint of questionable habit will cripple his efficiency. He should be interested in men rather than things. If you enjoy solitude, are inclined to be gloomy, prefer to study from books, and feel uncomfortable in a crowd, do not go into this profession, since your success cannot be what you would have it; but if you like to work with other people, and enjoy the swing of the crowd with yourself as the guiding force, and if your nature is social and your temperament optimistic, with the right preparation you may be a success in this career.

Training required. The training for work in physical education should consist first of a high-school course, during which you should take whatever work is given in your gymnasium and should play on all the teams possible. A general course in a college where there is a strong department of physical education is an advantage. There, as in high school, take part in athletics and learn to play all the games you can. Enroll, by all means, in the various courses offered by the physical-education department. It may be, as in a number of colleges, that these courses will be all that are needed to fit you for the work.

In most cases, however, the best preparation is not secured in college, but in a special training school. Write to some of them for catalogues, and look through the courses of study to get an idea of what studies are taught. Notice the expenses and time required to complete the course and also what positions are held by their graduates.

To reach the highest positions and salaries a medical education is of distinct advantage. The doctor can do

much more as the head of a physical-education department than can the usual director, and his services are valued accordingly.

Remuneration. Salaries vary widely, according to the position and qualifications of the director. College graduates of little special preparation often teach some subjects in the high school in addition to managing the athletics, securing salaries of from $60 to $150 per month. Where more emphasis is placed upon physical education, as in high schools having a gymnasium, Y.M.C.A.'s, etc., a man of better preparation is required, his salary ranging from $800 to $2500 a year. In college work the man who has charge of this department is often advanced to the rank and salary of a full professor, in which case he may receive in some institutions as high as $3000 a year.

THE OSTEOPATH

Nature of osteopathy. While commonly confused with massage, osteopathy is very different. Massage is scientific rubbing, and always as an adjunct to the work of a medical practitioner, while osteopathy is not rubbing, but stretching the muscles and readjusting minute displacements of the bones, and this as a complete and independent method of treating disease.

The theory of osteopathy in general is that since the body is a perfect machine, it is never out of order or diseased unless the circulation of the blood or of the nerve energy is somewhere interfered with. This interference, it is held, usually results from too great a pressure of bones and muscles on blood vessels or nerve centers. So instead of using drugs these practitioners use the bones of the body as levers for stretching muscles and readjusting other bones, hence the name "osteopathy," which means treating disease by use of the bones.

Training and remuneration. As a rule, osteopathic physicians do not treat infectious or contagious diseases. Their work is largely office practice, and hence their hours are more regular than those of the medical doctor. Owing quite largely perhaps to the under-supply of osteopaths thus far, their remuneration from the beginning of their practice is as a rule fairly certain, and throughout their professional career a large proportion of them succeed financially. Practically the same natural qualifications and the same kind and amount of preparation are required for success here as in medicine.

THE SOCIAL WORKER

Men are interested in their fellows. They are coming to see that since we are all members of one body, if poverty and vice are unchecked it makes a difference to them personally. It has been found, too, that the old theories of "let alone" and "do nothing" are fundamentally false, and that "the world only grows better because," as John Morley puts it, "people wish that it should, and take the right steps to make it better." Now it is because this large amount of work should be done in the proper way that there arises the need for trained social workers. An extremely varied field of activity is here presented, too varied for anything more than a brief indication of what it is like.

Organized charity. An old, old form of social work is charity. This, under approved methods, is managed by one central body, with some such title as "The Charity Organization Society." Here the attempt is made to provide sufficient aid to place a person or a family on a self-supporting basis, and also to prevent them from securing aid from several sources. In case a town or county renders such assistance, a farm is often maintained on which are kept those unable to support themselves. The state as well as the town also does considerable charity work. And

in times of special need, as during floods or other disasters, the federal government extends aid. All this work must be organized, supervised, and the results checked up.

The care of defectives and delinquents. The care of defectives is another long-standing form of social work. The blind, the crippled, the feeble-minded, the insane, cannot breast the world as normal individuals do, and for humane reasons must be sheltered. This is usually done in institutions, some being under state control, others receiving funds from county, city, or private sources.

There is also a delinquent class to care for. Boys and girls may be wayward and need the discipline of reformatories, usually termed "industrial schools." Or their needs may be met by juvenile courts and probation officers. Adults may show themselves unfit for social life; and, as a result, there must be jails, work yards, reformatories, and prisons.

The prevention of social misfits. While this work is all of importance and must be done, scientific social workers are no longer content to take the vast throng of social misfits, the dependents, defectives, and delinquents, and merely care for them. Such a task they have come to see gives no satisfactory results; new calls arise faster than old ones are attended to. So the emphasis is coming to be placed on prevention rather than cure. The dominant note of the modern social worker is to reach out and save from distress, to crush the forces of evil which drive their victims by thousands into almshouse, jail, and prison. This gives a new point of view and a new field of work.

It means, for one thing, instead of doling alms, giving work. This requires a study of unemployment, industrial conditions, and employment bureaus. But many are too young to work, or have labored under conditions which have destroyed their ability to produce, or perhaps they never were qualified to do anything well. Here is a situation which requires a wide sweep of remedial and preventive

action. There have been developed new measures in public health, conditions of labor, housing, drinking, education, recreation, and religion, new movements which will make better conditions and better men and, by the interaction of these, a better social order for all people.

Demand for various kinds of expert social workers. This means that experts in modern social work find employment in a number of different lines. There are such positions as *investigator*, a man who can see clearly and can get the facts; *writer*, one who can mold public sentiment by means of newspaper or magazine articles; *lecturer*, a speaker who carries on the reform movement through addresses; *legislative worker*, the man who realizes that the strong arm of the law should back a good measure, and who, by lobbying and bill drafting, helps to get the needed measure on the statute book; *collector*, one engaged in raising funds, often by house-to-house canvass; *visitor*, who may be a trained nurse, a probation officer, or an unpaid friendly visitor; *office help*, some one to attend to correspondence, filing systems, tabulations, etc., as is common in usual office practice; and *executive secretary*, the best position perhaps of all, his duties being numerous and, as indicated by his title, executive in nature. In addition to the social activities directed by various governmental agencies, private benevolence assumes responsibility for a greater part of this social-welfare service. Good openings are also to be found by trained men in the welfare work now being undertaken by a number of large commercial and industrial companies.

Remuneration. The salaries paid social workers are not large as a usual thing. Their services, however valuable in reality, are of a sort from which little money seems to be produced. Since people pay best for services from which they can make money, it is not a vocation recommended for those interested mainly in remuneration. From $50 to $60 per month is the usual salary for well-prepared

beginners, and if successful $1200 to $1800 may be expected after a few years, while the leading executive secretaries receive much more than this.

Preparation. In preparing for social work one should complete a high-school course, and a college course which affords some strong courses in sociology. Students should also elect work in economics, municipal government, and such instruction in public hygiene or sanitation as may be given by the department of biology. Many men are holding good positions in social work who have had only such general training. College graduates without this training may find it to their distinct advantage to take the course mentioned below.

There have been established several schools for social workers, the one at New York being the best known. It is not necessary to be a college graduate in order to enter these schools, although some college work is desirable. Write for catalogues, and look the courses through and estimate the expenses. You should have no difficulty in securing a position after completing such a course. In case of a two-year course, plan to devote all your time to the school for the first year, and during the close of this initial year keep on the lookout for a vacation position. It may happen that during the second year you can hold some position while carrying on the course. Graduation finds such a young man prepared and easily placed.

THE CHRISTIAN ASSOCIATION SECRETARY

The International Y.M.C.A. College says: The secretary as a social minister to the men of our times must know the needs of the modern city, its religious, social, and civic opportunities for service. He should be a student of conditions and understand how to get at the sources of evil as well as how to deal with individuals. Religion must throw off the guise of authority and seek to minister directly to the needs of the individual man. An Association officer must learn how to present the new message that is in harmony with modern science and the results of Biblical scholarship.

A religious educator and social servant. Preëminently an Association officer, whether he is a general secretary, a boys' secretary, or physical director, is a religious educator, and he should understand the problems of education. An adequate conception of personal work or personal service means an ability to help a young man wherever he may be in need. The physical director in the examining room, the educational director in interviewing a student, the employment secretary in the presence of an applicant, are just as much engaged in personal work as the leader who talks with the young man after an evangelistic meeting.

The Association officer must also know the community in which he lives. An unrelated work is sure to be feeble. The Association is a civic enterprise to which has been intrusted large property interests and financial support. The community has a right to expect an adequate service in return. Duplication of effort and competition with existing agencies will not long be tolerated. An Association officer must know how to make a survey of the community which he serves and to become a dynamic factor in its life.

Organizing and executive work. It will thus be seen that in social service, religious education, and in a knowledge of modern life and thought the secretary for the present day must be equipped as never before if he is to be of use in the Young Men's Christian Association. An Association officer is not only a religious leader, he must also be an executive. The special characteristic which differentiates the secretaryship from the ministry and many other lines of Christian work is the quality of being able to bring things to pass. Just as the minister is preëminently a preacher, as a professor is preëminently a teacher, so the Association officer is preëminently an administrator and an executive.

Business ability is necessary in all departments of Association service. An Association secretary should be trained in modern business methods. Efficiency is the watchword in administration to-day. Cost accounting and a careful estimation and testing of every department is demanded by boards of directors and committees. An Association officer must know how to conduct an office and organize it systematically. He must know how to manage an organization, how to report existing conditions in an intelligent and forceful manner, how to enlist committee service and lead boards of directors and also his associates on the employed force in the particular specialty which he represents. He also has an important relation to the public, and must understand the problems of publicity and of influencing the public mind through the press, the pulpit, the schools, the municipal government, and other means.

Demand for specially trained secretaries. At this writing (1912) there are 3700 positions in Young Men's Christian Associations on this continent which need to be manned. The secretaryship does not call for a large number of men. When the first secretary was employed in London, there were sixteen applicants for the position. The International Committee has a long waiting list of men who would like to enter the work of the Young Men's Christian Association. When a secretary in a town of forty thousand resigned recently, there were over twenty local applicants for the position. Most of these had little idea of the responsibilities or duties of this important office. In fact, no one of these men was appointed. The Association, through its international and state committees and metropolitan secretaries, has an elaborately organized system for seeking out suitable men for Association service, and yet it is exceedingly difficult to find the right kind of men and to place them properly.

THE PRIVATE SECRETARY

A man of large affairs usually has more on his hands than he can give personal attention. Here then is the task of the secretary — to meet callers, answer telephones, write letters, file correspondence, manage details, to be in short, what he is often called, "the executive's second self."

Qualifications. The general qualifications for this work are tact or adaptability and the sense of organization or ability to systematize work. Usually, stenography and typewriting are essential. Special qualifications vary with the demands of the particular position. One young man, absolutely without experience, received $100 a month for part-time work because he knew economics and English composition, and a wealthy business man wanted to become author of a book.

A very small number of schools prepare definitely for this work. Practically all secretaries have taken high-school courses as a beginning, but the additional training has been varied. Some have studied law, some have come from newspaper work, others are stenographers and typewriters who have graduated from business colleges and while in the regular employ have been selected to assist the general manager.

Remuneration and advancement. Salaries range from $15 per week, what may be expected by a young man at the start, to the several thousands per year received by the President's private secretary.

There is one important advantage in this vocation, moreover, which should be borne in mind. The secretary is in a splendid position to learn. He sees a successful man at work, and has full access to valuable information, much of which is private and could not be secured elsewhere. This means he is in a good training school, with the best of opportunities to become a man of importance. It is rather interesting to note that when Mr. Taft was president and Mr. Hillis his private secretary, the former had a salary of $50,000, the latter $7000; but that shortly afterwards ex-President Taft received $5000 as a professor at Yale, while ex-Secretary Hillis became head of a commercial concern at $20,000.

EXERCISES

1. Talk with the physical director of your local Y. M. C. A. or high school about his work. Ask his advice about it as a vocation.

2. If your town has any organized form of social work, such as a social-service league, what service does this organization render the community?

3. Learn from some inspector of the health department, building department, or labor department, what you can concerning his vocation.

4. Do any of your local manufacturers carry on welfare work? If so, interview the social worker who has charge of it.

5. If your town has a Young Men's Christian Association, what are the activities of its general secretary?

6. Have any of your friends become private secretaries? Of what advantage would it be for a young law graduate to be private secretary to some prominent lawyer?

THE PRINTING TRADES

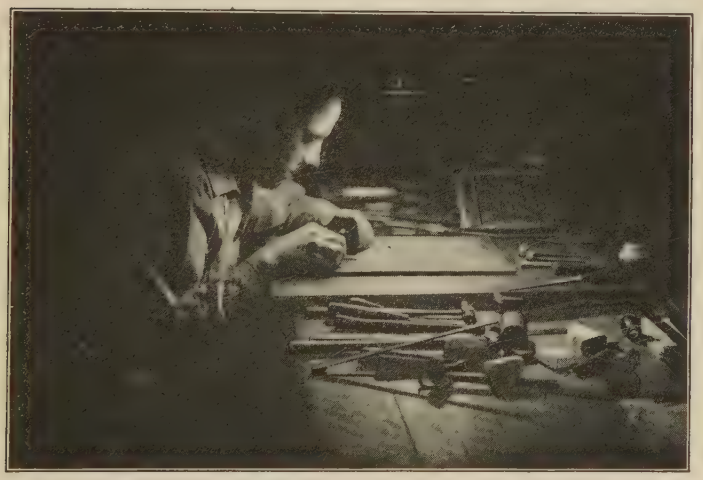
There is a constant increase in the amount of printed matter demanded by the American public, and hosts of printers are needed to meet this demand. Their work has grown to be much more complex than when one man in his small plant edited and printed the local paper and did all the job work required. Now this man's activities would represent several different trades.

Typesetter. When Benjamin Franklin learned to be a printer, he stood before a "case" in which the type was kept in a series of little boxes. The young printer had to learn this case thoroughly, so that with his copy before him his hand could go quickly and accurately to the compartments containing the proper letters. And in many offices to-day the use of the case is still maintained; much of the typesetting, however, is now done by the linotype and monotype machines. Their use is perhaps best learned in schools, maintained in most of the large cities, whose courses are only a few months long.

Boys often commence by making themselves handy around the composing room, and later are called upon to set type or to distribute it again into the proper boxes. While this may be readily learned, it takes time to acquire accuracy and speed. Wages at the start are from $4 to $6 a week, and are increased until at the close of his apprenticeship of four years the full journeyman scale is received. A good typesetter, or compositor, as he is called, earns about $1000 a year.

In connection with typesetting is the work of proofreading. After the type is set up a "proof," or preliminary impression, is struck off, which is taken by the proofreader and compared in spelling, punctuation, and paragraphing with the original manuscript. Besides technical training the proofreader needs a good general education and an accurate knowledge of the English language.

Electrotyper. When a circular is to be made in a large number of copies, or a book set up which may run through several editions, "plates" are made, and impressions are printed from these instead of from type. These plates are of hard metal, and the making of them requires several distinct processes. The workman is called an electrotyper, and usually is employed by a book-publishing house, a big newspaper



The engraver

This picture itself is an example of the engraver's work, as are the other pictures shown on preceding pages

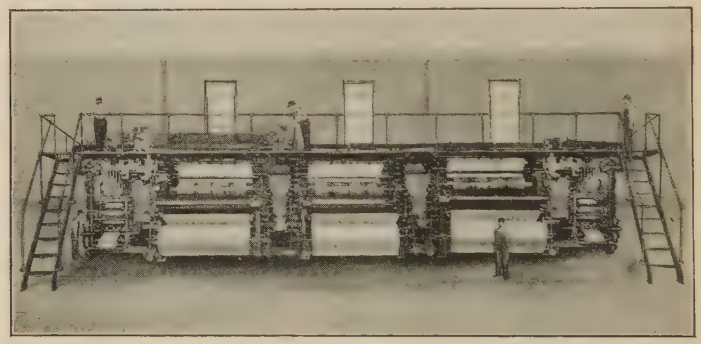
plant, or a concern engaged exclusively in electrotyping. The wages are rather better than for typesetting, but positions are by no means so numerous.

Engraver. The pictures in this book, as well as similar pictures in magazines and newspapers, have been made by the half-tone process. The work is highly skilled, and is usually done by concerns making this their exclusive business. The demand for engravers is large, and workmen receive approximately $1200 per year, but at present there

are few schools of instruction, and for most boys the only way open is through apprenticeship.

Pressman. In the pressroom the type and illustrations arranged in forms are brought into firm contact with paper by means of presses, and thus the printed sheets are made. The presses for printing range all the way from small job presses for printing cards to immense self-feeding cylinder presses of intricate mechanism.

Ruling, binding, embossing. These positions are found in most printing plants of any size, but their desirability is



A modern printing press

Newspapers are printed, folded, and delivered automatically at the rate of a million pages per hour. Such a press, however, is but one of the many devices used in making the printer's work more highly efficient

somewhat lessened by the competition of girls working for low wages and by the use of automatic machines.

Advantages and disadvantages of the printer's trade. One advantage is the steady employment, possibly no other tradesman being more regularly employed than he. Again, his work may keep him in touch with new ideas, which may prove of particular value to him, as was the case, for instance, of a friend who was interested in law and whose work was setting type for new law books. As a rule, the printer's activities include sufficient variety to prevent any monotony

in the day's work. Disadvantages are found in the constant menace of lead poisoning, the bad air in which job work and electrotyping are often done, and the night work required by the daily newspaper.

Qualifications for success. To make a success of this work, a boy should have good eyesight and sound lungs, accuracy and quickness of movement, and should not be afraid of soiling his hands. While a good common-school education is absolutely necessary, "if he is fortunate enough to have the advantage of high school," writes the Secretary of the International Typographical Union, "he will find the additional education obtained therein of advantage to him." Correct spelling, proper punctuation, and a knowledge of grammar are especially important.

Boys who have learned the business from the ground up and who have a love for the work may often do better by setting up in business for themselves. Many who do this, however, fail to make more than their regular wages, the reason usually being their lack of business ability. A young man should remember, then, that knowing the work and enjoying every phase of it is not enough, but should ask himself, Do I know how to buy the proper stock? to employ and manage men? to deal with customers and work up a good trade? to keep careful oversight of my business so that I can tell where the losses are and where my profits come in? An ambitious young printer who can answer these questions satisfactorily or who can learn to do so has good prospects for success in a business of his own.

THE ARTIST AND ILLUSTRATOR

This vocation may call up visions of great painters, like Millet, Landseer, or Turner, but what is meant here is a much more ordinary sort of work, which, although perhaps less in favor among artists themselves, is demanded by

business and serves a useful purpose. We have in mind distinctly commercial work.

Air-brush worker. This is a very humble form of art work. After the design is stenciled on the cloth, the worker does not spread the color with an ordinary paintbrush, but throws it in a fine spray by means of an air brush. The spray from the brush saturating the air makes this kind of art work a most unhealthful one. The work is seasonal, the wages are from $6 to $15 per week, and real artistic ability can demand little more.

Novelty painter. In this work such articles as powder and puff boxes and other celluloid articles are decorated by hand. Combs, too, are painted, the designs usually being engraved beforehand and the gold applied with a small brush. Neatness and speed are necessary. The work is seasonal, and the wages are from $18 to $25 per week.

Catalogue illustrator. The mail-order houses issue catalogues twice each year, and the wholesalers lay before their trade the latest designs in costumes, fabrics, trimmings, buttons, braids, etc. Fashion artists are employed to copy these, often in full color, featuring the strongest selling points. These copies are usually paid for by the piece, something like $3 to $5 per figure. This same work is also utilized by the houses dealing in patterns. Part of this illustrating, such as that in catalogues issued by high-class jewelry firms, requires no mean ability, and is well rewarded.

Magazine illustrator. There is great demand among the magazine publishers for attractive cover designs, appropriate decorations, and illustrations for stories. Sometimes the designs are suggested by the editor, who employs someone to do the sketching for him. More often, however, the drawing is produced by some independent artist and submitted by him to whatever magazine he thinks may find it suitable. If he shows ability to turn out usable illustrations when needed, he may secure the firm as a regular customer.

Book illustrator. To illustrate a book satisfactorily requires considerable skill as an artist and the rare ability to work well with both author and publisher.

Advertising illustrator. This is perhaps at present the best paying of all fields for the commercial artist. As much as $1000 has been given for a full-page drawing, and when it is realized that to secure the fourth-cover full page in color of *The Ladies' Home Journal* for one insertion costs the advertiser $10,000, it is clear that the drawing may be cheap at the price stated above. Advertising, in the main, is bought and sold like other commodities, this work being done by advertising agencies. Some of these agencies have a staff of artists in their regular employ. Any artist, however, who has a drawing may submit it to these agencies or to some one of a very few companies who deal exclusively in advertising illustrations. For success in this work, it may be added, the artist needs a sense of commercial values and some knowledge of the principles of advertising.

The practical *versus* the ideal. It is thus evident that important commercial openings may be secured by artists. Many of them, however, scorn commercial work, preferring to live on "bread and water" rather than put their talent to this sort of practical use. Such an attitude should not be too severely condemned, since it is partly because the artist's ideas are different from those of practical persons that he is an artist at all. Still, there is no advantage in being falsely devoted to one's profession, and the young man who can both aspire to emulate the masters and turn his talents toward practical use is the ideal artist who daily makes a success of his work.

THE PHOTOGRAPHER

A good way to test yourself regarding photography as a vocation is to begin as an amateur. Cameras can be purchased at a wide range of prices and of several styles, both film and plate. The film sort are much more convenient, though if you yield to the slogan "you press the button and we 'll do the rest" you will never learn photography as the professional practices it.

Use of a plate camera. If you are seriously interested in photography as a career, get a plate machine such as the professionals use. Read the instruction book with care, visit some photographer to see how he does the work, and then fit up a dark room. Begin to take pictures and do better each time. Subscribe for some good magazine and read some books on photography.

Necessity of business ability. Does this business interest you as a life-career? If so, choose some successful photographer and learn the business with him. You will find several kinds of work to do. First, there is the purely business side. A studio must be rented, supplies purchased, advertising placed, and displays made. While this may seem little like photographic work, to neglect it means failure. Photographers in whom the artistic is highly developed are apt to neglect these things, and thus fall far short of the financial rewards they otherwise deserve.

Taking pictures. When the photographer is ready for business the pictures must be taken. Here is an activity requiring skill in dealing with people as well as photographic knowledge. The operator has need of the salesman's ability when it comes to finding out what is desired or to stimulating a new demand. It requires a high degree of tact to get natural poses; people must be cleverly entertained and made to forget, as far as possible, that they are having their pictures taken. It also requires a high degree

of art to pose them so that their strong and attractive qualities will be brought out clearly. People no longer demand that whatever their true appearance is they shall be pictured as beautiful, neither do they wish their blemishes and weak features emphasized.

Developing and retouching. After the picture is taken it must be developed. This is an intricate chemical process; the good dark-room operator must know the influence of each chemical element in the developer, and if he is able to work in harmony with the one who takes the picture, a better negative results. The negative once made is next retouched. This work is frequently performed by women. After retouching, the prints are made and the picture finished.

Much depends upon the size of the business as to how specialized these processes are. In small studios or in those catering to a select clientele, the proprietor may do all the work himself. In larger studios one man may serve only as operator, another as printer, etc.

Commercial photography. In addition to studio work, as described in the preceding paragraph, the photographer may take pictures of machinery for manufacturers, of houses for real-estate agents, of parades or other special occurences for newspapers, and the like. Such work is known as commercial photography, and in the large cities, especially, it affords employment for many workmen. Some of these artists are outdoors much of the time (as the operator of the motion-picture camera); others work indoors (as the maker of stereoptican slides or copier of photographs in an engraving house).

Advancement. It requires three or four years to learn all the photographic processes well enough to be ranked as a professional. This time may be reduced by attending a college of photography, of which, however, there are only a few. Boys commence at from $4 to $6 per week, and advance as they become proficient, until they receive fairly good wages.

Not a great deal of capital is required to set up in business for one's self. But before starting, it is well to make a thorough study of the location, the number of people who are prospective customers, and the number of competitors. It requires on an average a population of about 6000 to support one professional photographer, although, since pictures are not regarded as a necessity, much also depends upon the class of people.

The photographer may be able to extend his income somewhat by doing finishing work for amateurs, of whom there are about 650,000 in the United States who spend on an average approximately $35 each per year for materials. But this work, as well as the sale of the materials, is more often handled by regular photographic dealers, who are usually associates of the photographic trust.

EXERCISES

1. Discuss briefly the history of printing. Consult an encyclopedia or your general history text for information.

2. What is a linotype machine? Write to the Mergenthaler Linotype Company, New York, asking them to tell you about the machine. See one in operation if possible.

3. What is the difference between a job press and a cylinder press?

4. Visit the largest printing establishment in your vicinity. Notice especially what improved machinery is in operation. Ask the proprietor his advice about printing as a vocation.

5. What phase of the artist's work interests you most? If you know anyone who is an artist, ask him about preparation for an art career.

6. Have you ever operated a hand camera? Was it film or plate? Did you do the finishing?

7. Interview some local photographer. What questions should you ask him concerning his work?

THE AËRONAUT

Interest in aëronautics. Every boy is interested in this occupation. Very likely the use of the aëroplane is in its infancy and will develop into an industry of considerable proportions. Nevertheless, young men in high school should not overlook the fact that many thousands of aviators now in war service will after a time be available for whatever positions develop in the commercial use of the aëroplane. In consequence, it is doubtful if the editor of *Aëronautics* was not entirely right when he wrote very frankly as follows concerning aëronautics as a life career:

THE DEMAND FOR AVIATORS

I do not see how flying would interest students. There are now many more pilots than there are jobs. Exhibition flying is rather precarious these days, and there is no large and properly equipped concern handling exhibitions. The few wealthy sportsmen who have bought aëroplanes obtain their chauffeur-pilots from the company furnishing the machine. A very few aviators are employed by factories to give demonstrations or by schools in teaching flying.

THE MUSICIAN

The musician's work is refined in nature and usually brings him in touch with cultivated people. It also provides much opportunity for advancement, since a musician of established reputation is sure of increasingly frequent engagements at terms of a very satisfactory sort.

Education and training. But little general education is required. An appreciation of art and poetry and a knowledge of some foreign language is desirable, but one language and arithmetic through fractions suffices, and many masters and noted teachers have not had more. But it is vastly different when we consider the musical education. The special training should be commenced in boyhood, kept up several years in private lessons, continued either by a conservatory course

or under further private teachers, and, for the best preparation possible, completed by extended study abroad. This, of course, means a long and expensive preparation.

Its cost, however, may be cut down somewhat by one's engaging in the practice of the profession before completing the course. There are a number of opportunities for such work, such as singing in church choirs, playing at receptions, etc., part-time efforts which may yield much experience in addition to money returns.

Remuneration. The profession, however, is overcrowded. This may be due in part to the fact that many people cultivate music as an accomplishment or mark of leisure, and others, who would seem to belong to such a class, are content to accept small returns because of the social desirability of music. It appears, then, that a part of the rewards must be sought merely in a love of the work.

The financial returns may be increased by engaging in several related musical activities. For instance, one successful musician leads the band in its evening lessons, on other evenings plays in a theater orchestra or at receptions, and during the day gives private lessons on violin, guitar, cornet, and piano.

Combination with trades. Still other musicians, especially those who play in bands or orchestras, follow some regular trade during the day. For instance, in a recent issue of the *International Musician* appeared this notice:

> WANTED — First-class violinist and cornetist who are expert cigar makers by trade (union men only), to locate in a city of 10,000, to play in theater and dance orchestra; fine opening for steady men. Address E. M. C. ——, ——.

Of course a musician's life is apt to mean irregular hours of eating and sleeping, and the result is a strain on the nerves and health.

THE BAKER

The following reasons why a young man of ability should enter the baking business have been submitted in a very interesting letter by Mr. H. R. Clissold, editor of the *Bakers' Helper*:

The usefulness of the baking industry. No one can engage in a more useful business than the manufacture of good food. The baker's chief product is bread, and bread is the chief food of mankind. Its production demands and deserves the best there is in any man — the best training of heart, head, and hand, and the best application of that training. A soulless man will not have the best success as a baker; he will yield to the temptation to do inferior work, and so fail to grow. In none of the many commercial activities of our age more than in the making of food is it important that a man be dominated by high moral purpose. A narrow-minded man can never have the best success as a baker. The industry offers a field for the exercise of the best thought and care, and the modern baker has abundant occasion to use the highest mental and manual training it is possible to secure. He may not need to work at the bench or at the oven; but he has added leverage if he knows how to do things as well as what to do, and why.

A broad field of enterprise. Bakers to-day are doing only about half the business that should naturally come to them. Baker-made bread ought to have at least as good a place in public esteem as tailor-made clothes now hold. It is reaching out for that place, and is advancing toward it more rapidly than at any previous time; but there is much to be done before the goal is secured. The realization of this ideal is worthy of any man's ambition; its achievement will come only through the exercise of high purpose, clear thinking, wise planning, persistent effort. In the last ten years a quiet but radical transformation has been going on in the baking industry; the next decade will witness the general recognition of the change. The baker is steadily coming to his own, and soon he will not (as too often at present) be thought of as a man of low ideals, of little ambition, of mean capacity for large affairs. A better chance was never presented to young men of character, of ambition, of energy, to take advantage of a rising tide.

The improved equipment of bakeries. Neither time nor space permit details of the revolution in the baking business already referred to. It may suffice to say that the dark, ill-smelling cellar shop is fast giving way to the specially designed and carefully built bakery, with plenty

of light and fresh air, with hard floors and tiled walls, with lockers, baths, and white suits for workmen, with cleanliness and system everywhere. The science as well as the art of bread-making is studied; the microscope, the scales and the testing tubes of the baking chemist have an assured place; luck and chance in bakery operations have given way to intelligent and accurate control of conditions. Hand mixing of dough is fast becoming obsolete; hand labor in the weighing and molding of loaves is being displaced by automatic mechanical devices. And the great improvements already made in equipment are but suggestions of further improvements. The baker has developed a new respect for the inventor and the machinist, and this trinity are working together for good to-day and greater good to-morrow. The baker's traditional conservatism has given way to an almost feverish desire for better methods, better appliances, better results. The atmosphere of the baking world is such as to spur any intelligent, ambitious young man to do his best. Rewards are plenty, and within reach.

The opportunity for money-making. This is not the chief reason why a young man should be a baker; yet in the minds of some men it will outweigh all others. The bakery is not a mint; but for all that it is a good money-maker. It is not a place to clean up many thousands in a day, as in some fortunate speculative ventures; but neither is it subject to sudden and sweeping losses. It affords a fine opportunity for steady habits, hard work, intelligent methods, sane enterprise, economical management, plain common business sense, to tell in regular and reasonable profits. In every town and city in the country are to be found ordinary illustrations of the money-making possibilities of the baking business, with notable illustrations in sufficient number to warrant a firm belief in the industry so far as its financial returns are concerned. Its principal product is universally used, and in constant demand, all the year round, in good times and bad. The business fluctuates little because it deals for the most part with a necessity — not a luxury. With every year there is an increase in the number of people who demand the best in food, and are willing to pay the best prices for what suits them.

EXERCISES

1. Have you ever seen a monoplane, biplane, or dirigible? Explain the difference in their construction.

2. What plans are under way for making flying less dangerous?

3. Interview a local musician. How did he secure his training? In what different activities does he engage?

4. How do Americans compare with foreigners in musical appreciation? Are we improving in this respect?

5. It is said that Argentina formerly spent more for brass bands than for public education. What is your opinion as to the wisdom of this?

6. What is the difference between a bakery manager and a journeyman baker?

7. Report to the class on your visit to some local bakery.

8. Should women bake bread, pies, cake, and the like, or buy them of the baker? In which direction, as a matter of fact, do we seem to be moving? What effect will this change have on the bakery business?

READINGS AND REFERENCES

Books

ABNEY, SIR W. DE W. Instructions in Photography. Edward L. Wilson Company, New York. $1.50.

AFFLECK, G. B. Bibliography of Physical Training and Hygiene. American Physical Education Association, Springfield, Mass., 1912. 40 cents.

CURTISS, GLENN H., and POST, AUGUSTUS. Curtiss Aviation Book. F. A. Stokes and Company, New York. $1.50.

DEVINE, EDWARD F. Misery and its Causes. The Macmillan Company, New York, 1909. $1.25.

ELLWOOD, CHARLES A. Sociology and Modern Social Problems. American Book Company, New York, 1910. $1.00.

KELLEY, FLORENCE. Some Ethical Gains through Legislation. The Macmillan Company, New York, 1905. $1.25.

LOENING, GROVER C. Monoplanes and Biplanes. Munn and Company, New York, 1911. $2.50.

MORRIS, R. C. History of the Y. M. C. A. Association Press, New York.

NATHAN, PAUL. How to Make Money in the Printing Business. Oswald Publishing Company, New York. $3.00.

SHERMAN, GEORGE. Practical Printing. Oswald Publishing Company, New York. $1.50.

WARD, EDWARD J. The Social Center. D. Appleton and Company, New York, 1913. $1.50.

Pamphlets

How to Make Good Pictures. Eastman Kodak Company, Rochester, N.Y., 1913. 25 cents.

Physical Education as a Profession. International Y.M.C.A. College, Springfield, Mass. Free.

Printing and Allied Trades. Bureau of Vocational Guidance and Industrial Education, Buffalo. 15 cents.

The Secretaryship as a Life Work. International Y.M.C.A. College, Springfield, Mass. Free.

Social Work. Russell Sage Foundation, New York. Free.

Periodicals

Aëronautics. Monthly. Aëronautic Press, New York. $3.00 per year.

American Physical Education Review. Monthly. Springfield, Mass. $3.00 per year of nine numbers.

Association Men. Association Press, New York. $1.00.

Bakers' Helper. Monthly. Bakers' Helper Company, Chicago. $1.00 per year.

Photo-Era. Monthly. Wilfred A. French, Boston. $1.50 per year.

The American Printer. Monthly. Oswald Publishing Company, New York. $3.00 per year.

The Photographic Times. Photographic Times Publishing Association, New York. $1.50.

The Printing Art. Monthly. University Press, Cambridge, Mass. $3.00 per year.

The Process Engraver's Monthly. Spon and Chamberlain, New York. $2.00 per year.

The Survey. Weekly. 105 East 22d Street, New York. $3.00 per year. (No magazine can be more highly recommended for social workers.)

PART III

VOCATIONAL ADJUSTMENT

CHAPTER XIV

CHOOSING YOUR LIFE WORK

To business that we love we rise betime, and go to with delight. — SHAKESPEARE

The high prize of life, the crowning fortune of a man, is to be born with a bias to some pursuit, which finds him in employment and happiness. — EMERSON

Know thyself. — SOCRATES

A very serious matter confronts you. The investment of yourself, all your energy, brain power, hopes and dreams — it is the most important decision you have ever been called upon to make. If you had $50,000 to invest, would you not proceed with great deliberation, investigate every market, talk with people who knew the facts, and guard carefully this money in the meantime? You have more than that to invest, for you would not take twice $50,000 for yourself. You are to invest yourself in some vocation, to give brain, muscle, and ambition freely at its demands, gradually to give up all thought of ever doing anything else than this, and to work faithfully in its service, for thirty, forty, fifty years. Are you giving this one really big investment the attention it deserves? Let us consider carefully the details involved.

The vocation itself. The various life occupations have been laid before you. You know something of their requirements, conditions for success, advantages and disadvantages,

and the compensation. You have worked through a number of exercises which have yielded you much information, especially concerning the conditions in your own community.

Perhaps the members of your class can make a vocational survey of the community. All the different businesses, from the coal company to the bank, can be canvassed. The number of clerks needed, the demand for stenographers and typewriters, the openings for electricians, engineers, carpenters, plumbers, etc., can be tabulated. Their respective salaries for the beginner, for the average adult, and for the exceptionally able man can be learned. Charts can be made showing all the desirable openings there are in your community.

The first thought of the ambitious boy and the dreamer, too, is to go away somewhere to win success. Now it may be that in some other locality there is just the opportunity you need in order to grow, and that without this opportunity you will stand still. But do not be too quick to pack your trunk; perhaps your own community has an even better opportunity. It is no compliment to a young man's intellect to win silver dollars abroad when he has overlooked gold nuggets at home.

Either at home or elsewhere, there is some excellent place for you. Do not believe those carpers who say there are no good openings left. In this busy world, where tremendous things are increasingly being accomplished, men able to do efficient work were never before in such demand. When you come seriously to choosing your life work, a vocation can be found.

Your adaptability for the vocation. It is not alone the vocation, as one is apt to think, but the *vocation in relation to you*, which demands to be considered. "Is banking a good vocation?" Certainly. "Then I'm going to be a banker." It may be the greatest mistake you ever made. You like pulleys and belt wheels and tools and overalls;

the bank would be a prison, but the machine shop would probably be a satisfying place. Again let us impress upon you that it is not merely the vocation, but the vocation in its relation to yourself, that you must consider.

You have certain strong qualifications and certain weak ones. Life is a great race, and young men are warming up on the splendid cinder track which runs from here to success. Will you insist on forsaking this cinder track to run through brambles and over stones? Yet that is just what you are doing when you go into a vocation employing your weak qualifications. The cinder track represents your strong qualifications, and on it you can make good speed.

"But," you interpose, "cannot I make my weak qualities strong? Have not the famous men of history done this very thing? Is this not the purpose of education?" There is much truth in what you say, for we all admire the man who develops his weaknesses into strength. It is inspiring to read how Demosthenes cured his lisp by practicing for long hours with a smooth pebble in his mouth, how Andrew Jackson weeded out his uncouth ways and finally impressed Washington society with his courtly manners, and how Theodore Roosevelt, a pale, sickly boy, earnestly schooled himself to become our famous strenuous president. You can do much, and education will help you a great deal, in making yourself over.

Nevertheless, there may be a large element of danger in this kind of reasoning. Many have the idea that it is easy to make themselves over completely. Some hold, in addition, that the best way for them to be successful is to enter a vocation demanding the very qualities now lacking, so that being spurred on by the new demands they will strengthen their weak points and thus become well-rounded men. This may sound well, but in practice it is as if the farmer were deliberately to choose a rocky hillside instead of a fertile valley on which to grow his wheat, "for would this not

prove him to be a very skillful farmer?" It would surely prove him to be a very foolish one, and the crop of wheat would certainly fall far short of what it might have been had he selected his field more wisely.

Comparison of your qualifications with those demanded by desirable vocations. You have certain strong qualifications. They are your "fertile fields." Cultivate them with your best effort, and rich returns will be the result. You will be doing something that you can do well, and success as well as contentment will be yours; while the day's work will seem short and agreeable when once you have chosen your proper vocation.

But how is this to be done? How can you find these fertile fields? *You must analyze yourself.* You are to take this list of qualifications, "straws which tell the way the wind blows," go through it point by point, and see what you can find out about yourself. You must make a self-inventory of your strong qualifications. No merchant could conduct a successful business if he had no idea of what was in the stockroom, the basement, the second floor, or on the shelves. Like the successful merchant, take stock of yourself, using as a guide the following chart:

CHART FOR SELF-ANALYSIS[1]

I. Physique

1. Strength

Strong: For many occupations muscular strength is essential; for example, the work of fireman, mason, plumber.

Weak: In other occupations such strength is not particularly essential, as in the case of piano tuners, bookkeepers, and jewelers.

Should you be classed as strong or weak? What occupations would your strength seem to indicate as desirable?

[1] For suggestions in arranging this outline we are indebted to Dean Schneider of the University of Cincinnati.

2. Health

Well: Continuous good health is always desirable, but some occupations, such as that of traveling salesman or foundry man, especially require it.

Sickly: A man subject to recurring attacks of illness cannot be depended upon to work regularly with others, but he may make a success of something he can do alone, such as writing, painting, composing, or some forms of piecework.

How are you to be classed here? Are you of a family always well or ailing? Has your high-school course been interrupted by frequent illnesses? What occupations especially demand continuous health?

3. Vigor

Vigorous: This is not the same as physique or health, for a man may be of large size and well but lacking in vigor. It means that the vital functions are active, that a man has "red blood," that he seems constantly to draw from great reservoirs of power. This is especially important to politicians, and executives who direct men personally.

Feeble: The man of slight vigor would be unsuccessful as a lawyer, but he might do well as a court reporter. He might also succeed as a bookkeeper, astronomer, chemist, or at other work of a somewhat secluded nature.

To which class do you belong? Classify several occupations on the basis of bodily vigor required. What vocational suggestions can be gained here for your guidance?

4. Bodily defects

Sound: Some vocations demand keen sense organs, a high development of sight, hearing, feeling, tasting, touch, or temperature sense, and freedom from bodily defects.

Defective: The color-blind man cannot be a locomotive engineer or a salesman at the silk counter, but he can be a farmer or a stationary engineer. A defective palate may ruin him for a tea sampler, but he may be a banker without handicap. Lameness may prevent one from becoming a civil engineer, physical director, or conductor, but it does not preclude success in such occupations as telegraphy, secretarial work, and the like.

Classify yourself here. You may find this difficult, for some defects can be revealed only by expert examination. What vocational hints do you get?

II. Mental Type

5. Kind of work desired

Manual: The minds of some men turn to concrete things. They like to measure, weigh, lift, have hold of tangible objects. They would be happy in machine shops or foundries, or in building houses or repairing automobiles.

Mental: The minds of other men are interested in thoughts, not things. They would be repelled by a greasy monkey-wrench, but they could build in imagination a new design for a touring car and joyfully sketch it out on paper. These men would make good designers, editors, teachers, lawyers, etc.

Do you like to think, plan, dream, and direct others, or do you like to get hold of things with your hands? Classify other occupations than those mentioned.

6. The location preferred for one's work

Outdoor: Some men love the great outdoors. They like wintry blasts, and miles of snow, and work which calls them into the open.

Indoor: Other men enjoy indoors. When cold weather comes they are especially pleased with their work as bookkeeper, teacher, barber, for it keeps them sheltered from the storm.

Name several occupations of the outdoor type; of the indoor type. Which class appeals to you?

7. The work's breadth of horizon

Large scope: Some men do not feel they are doing anything unless at work on a task of big dimensions. These large-scope men are contented as bridge builders, railroad engineers, contractors.

Small scope: There is a contrasting type, men who are interested in delicate workmanship. Such men are content to adjust the jewels in a watch, engrave designs or letters on silverware or gold plate, or turn out ivory carvings — a line of work that would drive the other type to desperation.

Does anything have to look large before it seems important to you? Do you scorn trifles, or do you prefer to do perfect work in every detail?

8. Your sense of accuracy

Accurate: Is your hand skillful in physics or chemistry experiments, or do you break apparatus and never get your problems very carefully worked out? Do you like to make accurate measurements, as the

civil engineer or the skilled machinist does? Do you like the logic of geometry, enjoy the careful marshaling of evidence in debate, possess the legal type of mind?

Inaccurate: In careful work are your fingers all thumbs? Does "about" suit you better than "just so"? Do you enjoy romance more than argumentation or geometry?

For what vocations would your habits of accuracy fit you? Or in which would your inaccuracies not be serious?

9. Orderliness in working

Orderly: An office boy to whom the misplaced letter file, the uncovered typewriter, or the broken window cord make no appeal would never advance to be office manager. Many positions, such as that of stock-keeper, require a place for everything and everything in its place.

Unorderly: Students' desks vary much in neatness and order, some being always in pell-mell condition. Some men likewise are so unsystematic that to keep things shipshape would consume practically all their time, and they are obliged accordingly to employ an orderly private secretary or to select a vocation in which their unorderly habits are not so serious a handicap.

How do you stand here? Classify several vocations on the basis of the orderliness required.

10. Activity of thought

Rapid: Some minds turn out thought-products with speed. The shortstop, without the least hesitation, sees the chance for a double play and shoots the ball to second. This sort of thinking is demanded by motormen, locomotive engineers, advertisers, and surgeons.

Slow: The thought processes of others are slow. If hurried, they cannot think at all. In emergencies they are helpless. But some vocations do not call for quick results; in them there is time to ponder.

Can you think quick as a flash when much depends upon it? If you are a slow thinker, what vocations might you choose?

11. Habits of study

Studious: The student's point of view is always held by some men. Whether they are in business, in a profession, or on a farm, they are always alert, always progressive, always studying their problems. They may, of course, open few books if these problems are best studied in other ways, but whatever the methods employed these men both know and learn. In vocations where rapid progress is being made, only such alert learners are able to push to the front.

Non-studious: The minds of others see no problems. They are satisfied with things as they are, and the call to study seems useless and the demand for change an irritation. It may be difficult for any pupil to see that he belongs in this class, since he studies every day, but the test is whether he is eager for knowledge and will keep on studying after leaving school. If he sees few problems and cares little for study, he should choose some vocation in which change and improvements are slow.

Are you mentally alert, possessed of much curiosity, alive to new and progressive methods, or is your mind rather content and inclined to be bored by study? List several occupations adapted to each type of mind.

12. Originality in ideas

Original: The original man is fertile in suggestions; his mind is creative, and this quality ought to render him proficient in advertising, illustrating, designing, and inventing.

Imitative: These copy; they have few or no new ideas of their own. They greatly outnumber the first class. They succeed best in conservative vocations.

In which class are you? Which vocations need new ideas more than others?

III. Temperament

13. The desire for security

Daring: Many men like to take a chance. They are ready for new enterprises. Such men are fitted for stock speculations, real-estate developments, putting newly patented articles on the market, selling on a commission basis.

Careful: Insecurity wears on the nerves of some men. Instead of being a stimulus, it paralyzes their best effort. Such men do their maximum work on stated salaries or in vocations where the rewards, though not large, are relatively certain.

Classify yourself as to security. Classify several occupations. What vocational suggestions are you able to draw from these?

14. Changeableness, or novelty in work

"Recently two of my students," says Dean Schneider of the Engineering School, University of Cincinnati, "were not doing well; both were getting into a condition of unrest. One was in a railroad shop; he complained that every job was different from every other job, that he was sent here and there, that there was no continuity to his work, and that he was getting nervous. The other complained that there was not enough

variety to his work, that it was too confining, that he could not move about and do things all the time, and that he was getting nervous. We gave each the other's place and both are swinging along and learning most satisfactorily."

Changing: Name several occupations whose duties call for changing activities.

Settled: Name several whose duties are of a routine nature.

Do you like new tasks? Do you enjoy doing the old tasks in different ways, or do you form habits readily? Do you enjoy doing things over and over in the same way? As you grow older are you likely to tend toward the changing or the settled kind of work?

15. Executive ability in directing others

Directive: The desire to direct others is deeply implanted in some men. They possess aggressiveness and enjoy shouldering responsibility, of saying to the general manager, "Give me a good crew and I'll see that it's done on time." This is a trait of great value to politicians, superintendents, foremen, and all personal leaders of men.

Dependent: Then there is the man who takes orders instead of giving them. He is retiring and sensitive, and his best work can be done only when stimulated by praise and appreciation. A man of this type might fail dismally as physical director, lawyer or railroad president, yet make an excellent chief clerk, chemist, confidential adviser, or statistician.

Do you enjoy standing upon your own feet? Do you like directing others, or to be told what to do, to have others bear the responsibility?

16. The kind of motive preferred

Materialistic: This type of man does things mainly as a means to an end — the securing of the material reward. He tests out every project by this searching question, Does it pay? If it does not, he drops it for one that does. The prospect of pay is his stimulus, and with it as a ruling motive he presses forward.

Idealistic: This type regards skillful work as an end in itself. There is joy for him in the mere doing of things well. He does work poorly paid perhaps, yet if it satisfies his instinct of workmanship, he is happy.

Which are you? If you are a materialist, what vocations will you avoid? If an idealist, what vocations might you seek?

17. The degree of control

Deliberate: The deliberate man always thinks before he acts, and while others around him may be acting rashly he remains cool and collected. Such a man is guided by his reason, and in consequence is apt

to be cold and lacking in friendliness. But men respect his ability and have confidence in what he says.

Impulsive: The impulsive man is more under the control of his instincts and emotions, and as a result he often acts at once and thinks afterwards. Usually he is warm-hearted and has many friends. Perhaps as a bookkeeper or an accountant he would fail, yet his genial, impulsive manner may bring him great success as a foreman, an orator, or a politician.

For greatest success in the following vocations should a man tend toward the deliberate or the impulsive type: jurist? retail salesman? minister? financier? statistician? playground director? As you grow older are you likely to change toward the deliberate or the impulsive type?

18. Adaptability to people and conditions

Adaptable: This is a quality some men have developed to a high degree of perfection. Like the arctic mammals whose fur is white in winter but brown in summer, they adjust themselves to every changing situation. They are "good mixers." This ability is very much needed by the insurance solicitor, the newspaper reporter, the photographic operator, the minister, and the politician.

Self-centered: This type is relatively unyielding; they do not bend easily in give-and-take relations with their fellow men. This lessens a man's power to work with people, but it does not by any means hinder to the same degree a research scientist, a bookkeeper, or a statistician.

Can you suit your thought and action to the changing hour? Can you bend without breaking? Or do you like to have things just as you left them, to have people "mind their own business" and leave you alone? Classify the following vocations according to the relative degree of adaptability required: that of reporter? stationary engineer? Y.M.C.A. secretary? lawyer? journeyman plumber? president of the United States?

Self-analysis card. Have you answered every one of these questions frankly to yourself? You need not tell anyone else what was found out, but do you yourself know where you stand? Pass none of them by without serious thought. Now you must get this information on paper. To have the facts is not enough; you should make a score card of yourself. Notice the following self-analysis card. Here is the same list of qualities you have just been working over. On the left is one type, on the right is the contrasting type.

The degree in which the quality is possessed is indicated by "very high," "high," "medium."

Take "Outdoor" and "Indoor," for example. The boy who delights to feed cattle during a blizzard, to spend his spare time skating, should probably rank himself in the "very high" degree column, next "Outdoor" on the left-hand "Type" column. The boy who likes to spend his recesses in reading instead of coasting, and enjoys nothing more than a book and the open fireplace, should probably rank himself very low as an "Outdoor" type, or, as it is arranged on the score card, check himself up in the "very high" degree column, next "Indoor" on the right. Where would you check yourself?

SELF-ANALYSIS CARD

Quality	Type	Degree in which Quality is shown					Type
		Very High	High	Medium	High	Very High	
I. Physique							
1. Strength	Strong						Weak
2. Health	Well						Sickly
3. Vigor	Vigorous						Feeble
4. Bodily defects . .	Sound						Defective
II. Mental type							
5. Kind of work . .	Manual						Mental
6. Location of work	Outdoor						Indoor
7. Breadth of horizon	Large scope						Small scope
8. Sense of accuracy	Accurate						Inaccurate
9. Orderliness . . .	Orderly						Unorderly
10. Activity	Rapid						Slow
11. Habits of study .	Studious						Non-studious
12. Originality	Original						Imitative
III. Temperament							
13. Security	Daring						Careful
14. Changeableness .	Changing						Settled
15. Executive ability	Directive						Dependent
16. Kind of motive . .	Materialistic						Idealistic
17. Degree of control	Deliberate						Impulsive
18. Adaptability . . .	Adaptable						Self-centered

On a plain sheet of paper make a copy of the self-analysis card, then take yourself in hand. Run down the list of qualities one by one. Make a small cross in the column which your candid opinion indicates is correct. Remember that it is no disgrace to find yourself in this column or in that. For some of the world's greatest men the majority of check marks would be in columns on the left, for others, on the right. But it is important to find out for every quality in *which* column to place yourself. Check the sheet to the bottom. We shall now leave this particular point for a moment, to return to it later on.

EXERCISES

1. What objections are there to drifting into a vocation?

2. When asked what they can do, why do boys often say, "Almost anything."

3. Whom can you get to help you most in drawing up your score card? Why can these persons help you most?

4. What is the difference between self-analysis and self-consciousness? Which is more helpful for you?

ANALYSIS OF VOCATION

Study of the qualifications demanded in your prospective vocation. After you have checked yourself up on the analysis card, the next thing to do is to study the particular vocation in which you are most interested. The best way to analyze it is not to think of the whole vocation in some hazy fashion, but to think of some particular men in this work and of some particular job which might become yours if you decided upon this occupation as a life career. In this way you will be more definite in what is wanted here — the clearest, sharpest thinking you can do. Before commencing, be sure to put resolutely out of mind all thoughts of what the self-analysis card revealed. You are interested here in the

vocation solely, just as if you had no interest whatever in how the analysis of the vocation would affect you personally.

Analysis of your prospective vocation. With this point of view, draw up a second copy of the analysis blank shown on page 311, writing at the top of the sheet the name of the particular vocation you are now to analyze. Then go down the list point by point, making a small cross in the proper column. For certain points you will have some difficulty in deciding which column is to have the cross. If some of these points seem impossible of classification, do not spend much time in puzzling over them. Skip them for the present and check up the others, then come back to them. You will probably discover that your knowledge of the particular vocation is very much limited, and that more investigation of it can profitably be made. Even after this additional study is made, however, the card may remain only partially filled in. Do not be discouraged over this, since in trying to check up the other points, you have assumed the student's attitude toward a prospective vocation, and this action cannot but help you in your proper choice.

Comparing the two analysis cards. When you finally come to compare the two analysis cards, do they fit together like a dovetailed joint, or are they opposed like two sworn enemies? Frankly, after looking them over and comparing them point by point, what do you think is the prospect of making a highly successful career out of the combination?

You may meet difficulties in analyzing yourself or the vocation, or in seeing the relations between them. In such cases it may be well to get help from your chum, your parents, or your teachers. Again, if in your high school or in your town there is a vocational counselor, consult him. From him you will get expert attention which is likely to be of lasting influence throughout your life. When your school days are over, another source of advice will be your employer. Wide-awake employers are realizing that if their

young men are not properly placed, both parties lose, and consequently these sensible men are anxious to steer their employees into suitable positions. "If we find," the employment superintendent of a leading insurance company writes, "that we have in the secretary's office a boy who has a tendency to delve in figures we immediately keep watch of him and when an opportunity shows itself in a mathematical or statistical division, he is transferred thereto. On the other hand, when a boy in the latter division is indifferent to figures but literarily inclined he is given an opportunity in some department where those talents are needed and developed." Too many companies, however, are entirely indifferent in this matter; but if your employer is interested, and more of them are becoming so all the time, you may expect some good advice from him.

Results of self-analysis and vocation-analysis. These analyses will furnish you a general plan of campaign. They will not tell you *exactly* how the victory is to be won, but they will indicate the strategic points. You can then, like a good general, mass your forces on these key situations, a very necessary plan, but one which as yet too many young men neglect. "Seventy-five applicants were interviewed for a recent vacancy in our typist force," says Charles H. Luddington of the Curtis Publishing Company. "At least fifty were obviously unfitted, and about twenty-five were tested before one competent worker was secured.

"To fill the position of correspondent it is necessary for the Curtis Publishing Company to interview from ten to fifty persons; to find a stenographer, fifteen to twenty-five; a typist, twenty-five to fifty; a high-grade clerk, twenty to twenty-five; an ordinary clerk, ten to fifteen."

Unfortunately, this means that a large proportion of young people choose positions by guesswork. They learn of a vacancy, and then say to themselves: "Well, that looks pretty fair. Guess I 'll take a chance at it." But success is no

chance; it is not won by the man who tries all vocations and who tries for all jobs; it is the result of effort wisely and earnestly directed toward some definite end.

Qualities for more than one vocation. It is also important to realize that you may be well fitted for more than one vocation. Self-analysis and job-analysis may have caused most vocations to be marked off your list, but they may also have revealed that in two occupations, perhaps three or more, you possess the requisite qualities. If your problem is which vocation to choose out of two or more possible ones, here are three bits of advice which may help:

1. *Making the decision.* Do not be overanxious about deciding at once provided the final decision is yet some years off. A young man once approached us, greatly worried over whether to become a college professor or a professional man, and he had done barely a half year of his high-school course! Do not try to have everything so fully planned that you will be writing down exactly what work is to be done on a certain day ten years from now. It is sometimes enough to know the general direction you should take; the details may be left to adjust themselves. In the particular case mentioned the young man had at least three and a half years of the same course in high school ahead of him, whether he decided on law or teaching, and it was unwise to waste his efforts over what was then an almost impossible problem for definite solution. If your case is of this sort, do not *stop* to decide; *go ahead* to decide. In so doing many knotty problems will work themselves out.

2. *Elimination by experience.* Eliminate one vocation after another by actual experience. Vacations are harvest times for the ambitious boy. They furnish a time for testing himself out. If you have decided to be a merchant, spend one vacation in a dry-goods store, another in a hardware store; or try your hand at furniture, and possibly in a grocery store or in a lumber yard. If you are hesitating

between civil engineering and railroad office work, carry the chain for surveyors some summer; sweep out the railroad office another summer, with your eye on the auditor's work and the secretary's department. Your principal or superintendent may know of many openings, in fact may be running an employment bureau on a small scale in the high school. You will not earn a great deal while trying out these different vocations, but you ought to regard the experience gained as very valuable.

3. *Comparison of prospective vocations.* Diagram for comparison and choice the vocations which appeal to you most favorably. This is always helpful, but especially so if your decision must be made soon. Draw up a comparison of these vocations in as many points as you desire. The diagram on the next page would serve for a young man deciding whether to become a journeyman plumber, a railroad engineer, or a physician.

Changing your vocation. Possibly after several years' experience you may not like your vocation. You have endured all the hard knocks the beginner has to take, and you have invested your time, energy, and thought in it for these years. But you want to change. Do you know what Professor Frank Parsons, the pioneer vocational counselor, once told a young man who thought as you do? "You have a house half or two thirds built, the walls well up, almost ready to put the roof on; now is it wise to leave the building you have so nearly completed and go off to a new location, dig a new cellar, and begin building all over again, when you do not know that you will like the new building any better than this one, after you get it?"

1. *Great loss from changing.* Is this not worth considering? Think what valuable knowledge is wasted when the man who has been a successful barber for ten years turns to writing insurance for two years and then goes into the grocery business. His soft, deft hand, worth hundreds of dollars

Deciding Questions	Journeyman Plumber	Railroad Engineer	Physician
Remuneration			
Paid while learning or only after having learned?			
What pay to beginner?			
How long to complete preparation?			
Cost of preparation?			
Annual earnings of average adult?			
Healthfulness			
Is the work especially healthful, or vice versa?			
How many years is average life career?			
Safety			
Any special dangers?			
Any difference in life-insurance rates?			
Value to society			
Is this vocation held in high esteem?			
What features has it which aid or hinder in securing social position?			
Advancement			
How old to start?			
What sort of work then?			
How high do salaries run?			
Does added effort secure added reward?			
Personal suitability			
In view of my analyses would this vocation make me well satisfied?			
According to the same analyses would I probably succeed in it?			

each year to a barber, is useless to the insurance solicitor, while his knowledge of insurance is of practical value to the grocer. If you were trying to roll up snow rapidly, would you work in turn with each of half a dozen small balls one after the other or would you devote all your effort to

one immense ball whose every sweep would draw bushels of snow to itself?

The architect does not set about building a house by starting one here and one there, trying to hit upon the right combination of parts. He starts by getting out his plans and making blue prints. Does not your life deserve as much care as the house you are to live in? When young men go through the same careful planning as the architect, there will be fewer life houses to be torn down because not started right.

2. *Advancement in the same vocation.* Yet some who once were satisfied that they started right now want to change because they can see no future advancement in their vocation. Is there none? Let us see. Your business, perhaps, is bookkeeping, at $15 a week. That does not look promising after four years' work, but do you know that your employer has two other factories, both larger? that besides having an accountant he has several other bookkeepers drawing much better pay than you are? If he should call you to the office to-morrow morning and say, "Can you handle the books at factory B?" could you do it? "I have n't studied any of the new wrinkles in bookkeeping," you say? Then, too, you take no business papers or magazines, you never have looked inside of a book on accountancy, and you did not know that the man who straightened out the snarl in your books last December was an accountant. Do you realize that although bookkeepers are plentiful, *extra good* bookkeepers are not, and that accountants receive salaries from $1500 to $3000 per year, with fees for outside work sometimes as high as $100 per day? and that there are a number of up-to-date books that you can read, and evening schools that you can attend? You do not have to leave bookkeeping in order to climb. Remain a bookkeeper, but look and work upward. The same is true of many other vocations. As a rule, you should not enter one in which such advancement cannot be found.

Self-improvement. You may not be satisfied with the young man revealed to you by the analysis card. The marks may be truthful, but how some of those little crosses make you wince. You wish that the results might be different. Can they be changed?

To a certain extent, possibly to a remarkable extent, this can be done. If your mind wanders, seize it sharply, bring it into line, hold it upon that theorem in geometry. Are you inaccurate, saying, "Oh, it's about nine inches," when in reality it is six? Give this inaccuracy thorough treatment, do that manual training just right, thank the teachers for handing back that careless solution of the physics problem. Are you a leaner, not a leader? Cultivate vigor, see that your digestion is good, that you take proper exercise and sleep well. Do not copy work from others or wait to hear how they answer that hard question; stand upon your own feet; lead and direct, every chance you get. Is your will flabby? Do a thing because you have said it shall be so, not because you *feel* like doing it. Read books which inspire you with a determination to do — and then act. Do you lack adaptability? Mix with people, rub off the rough corners in social intercourse; for even the diamond has to be polished.

In such ways you will be making yourself over. Do not be discouraged if the process seems slow, for human nature is a growth; like an oak, it is slow to develop but is enduring when perfected. Begin now, put forth effort, and have faith; for the results are certain. Your friends will note the difference; your analysis cards a few years apart will reveal the change. Make one now in order to watch yourself grow.

EXERCISES

1. Is it your difficulty to find one suitable vocation or to select one of several that seem suitable?

2. How can you set about deciding upon your vocation? Mention several things you can do with profit in order to reach the right solution.

3. What was the occupation you most admired when you were a small boy? when you entered high school? What do you suppose it will be ten years hence?

4. What helpful conclusions in choosing a vocation can you draw from the fact that our ideas of occupations, as given in question 3, gradually change?

5. In what vocations have you had first-hand experience? How has this experience helped you in choosing your life work?

6. Choose one trait revealed by the analysis card which is unsatisfactory to you, and, if you do not mind confessing what it is, tell just how you are setting about to mend it.

READINGS AND REFERENCES

Books

Davis, Jesse B. Vocational and Moral Guidance. Ginn and Company, Boston, 1914. $1.25.

Fowler, N. C. Starting in Life. Little, Brown, and Company, Boston. $1.35.

Marden, Orison S. Choosing a Career. Bobbs-Merrill Company, Indianapolis, 1905. $1.00.

Parsons, Frank. Choosing a Vocation. Houghton Mifflin Company, Boston, 1909. $1.00.

Pamphlet

Choosing a Career. Students' Aid Committee of High School Teachers' Association, 25 Jefferson Avenue, Brooklyn, N.Y. 10 cents.

Article

Schneider, Herman. "Selecting Young Men for Particular Jobs." *American Machinist*, April 10, 1913, pp. 597–600.

CHAPTER XV

SECURING A POSITION

Knowledge is power only when it can be made available, practical. — Orison S. Marden

In looking for employment, the most important thing is that you shall be able to do the work that your prospective employers want done. — S. Roland Hall

In working through the last chapter you have carefully estimated what qualifications you have for which employers will pay and also in what vocation these qualifications will command the most consideration. This has been decided. You are now ready to approach some individual employer and place before him your brain, your muscles, your ability to produce, and, like any business man, to seek to sell your commodities at a good figure. This is the crucial point, where the returns come in. It is foolish to spend long years in preparation, with no thought of how a position can be secured. From the first crude drawing of the design until the finished product is crated in the shipping room, manufacturers have their eyes ever on the market. Your natural qualifications, your training, your ability to produce, represent a like investment. These are your stock in trade. Should you not then, like any sound business man, give due regard to the marketing of your product? To show how this can be done is the purpose of this chapter.

Choosing an employer. All firms are not alike. Some are unprogressive, years behind the times. If you work for them you will learn bad habits, slipshod methods which will unfit you for the high-grade work demanded by better firms or

higher positions. Other firms have nothing in promotion to offer. They engage an outside man when important vacancies occur, they take no interest in training subordinates, their work is that dull routine which puts the brain cells to sleep, while their best employees are liable to discharge at the whim of the "boss."

"But the employee," says the former manager of the National Cash Register Company's employment department, "when he takes a position in office or factory, puts everything he is and has into the venture. He gives his time, his service, his experience, in return for a fixed wage. He gives more, however. He surrenders his individuality, his reputation, his capacity for growth — in one word, his business future — into the keeping of the organization he joins."

The employer investigates you thoroughly before he gives you a position; he wants to take no chances. Is it not even more important that you investigate him thoroughly, since you have vastly more at stake?

EXERCISES

1. Does the employer for whom you are thinking of working provide a system of instruction for his employees?

2. Did his foremen, superintendents, and managers get their positions through merited promotion, through relationship, or through pull?

3. Has he any middle-aged or old men working for him? What would become of you at forty-five if you should remain with him?

4. What general reputation has his firm? Would it be wise to work for him?

Locating the vacancy. You are not to conclude from what has just been written that all you will have to do is to weed out less desirable employers and take your pick of firms. Even if you stood first throughout your high-school course and came to the city with several medals, including a special prize from a business college, you may have difficulty in

locating one desirable vacancy. But when you accept the point of view that vacancies need to be sought for, there are at least five ways in which you can locate them:

1. "*Help Wanted*" *advertisements.* The daily papers and Sunday editions contain lists of openings. These sometimes afford you an opportunity to place yourself. Trade papers also contain such lists, which, while not offering so many openings, are more valuable since they are for the particular work you desire. If you want an office position, for instance, read the "want ads" in the daily papers and in business magazines.

2. *Employment agencies.* Some agencies perform a real service and charge a reasonable price. But be sure that you are dealing with a reliable firm, able to do what it claims, before you pay for service in advance of securing the position. Your name on the books of one or two good agencies will very likely prove to your advantage.

3. *Friends.* Your friends may hear of openings. Let them know your needs. If you have qualifications of your own upon which to stand, friends will be glad to help you get a start, and it is not asking too much of some of them to do this.

4. "*Positions Wanted*" *advertisements.* If you are seriously in earnest, you will not remain idle while waiting for a vacancy to appear. It will cost but little to place an advertisement of your own in the papers. In planning this advertisement, try to write it so that it will bring results. Employers are looking for efficient producers. Would this, for instance, which appeared in the *New York Times*, interest them?

> Harvard Graduate wants position with future; willing to start moderately and prove himself with time; have studied accounting; would prefer mercantile house. D. 178 *Times.*

Does this young man know what he wants to do? Has he definitely prepared himself for anything? Does he use good English? If you were an employer, would you send for him? Will he be as likely to get a position as the young man who, though in all probability much less expensively trained, writes as follows:

> AN EDUCATED young man, 26, with knowledge of bookkeeping and office requirements, desires position; good penman, industrious, persevering. W., 127 Powell St., Brooklyn.

In preparing the copy, jot down a list of your most important qualifications. With prospective employers in mind, arrange these in as clear, forceful, and interesting a way as you can. And do not stop with the first attempt. There is no merit in writing an average advertisement; what you want to develop is the ability to write one with a *position-getting pull*. Take your copy to the newspaper office and get one of the clerks to help you arrange it in display form. This will make it more noticeable and readable. If the position sought is of importance you can afford to present an advertisement something like this:

> BUYER WANTS POSITION
>
> Buyer in fur department large Chicago firm wants similar position with New York Dept. Store. Knows fur business from ground up; 16 yrs. experience, did $200,000 last year. 35, married, highest references including present employers. Wants good salary with prospects, but is worth it and willing to prove it. F. B. C., *Dry Goods Economist.*

5. *Estimated vacancies.* Suppose that you, in this case a civil engineer seeking a position, see in the morning paper that the surveying for a new trolley line is to commence in

three weeks. Does it have any meaning for you? The quick-witted youth will without delay have his application hurrying toward headquarters. New developments and reorganizations are recounted continually in the daily and trade papers. They mean vacancies, and as such have an interest for you.

In nearly all large establishments there are changes, either expansions, resignations, or other readjustments, going on all the time. Practically every concern with which you are well qualified to work represents in this way possible openings. Keep your eye on these companies and send them letters of application. There may be no vacancy when the letter is received, but if the employment manager is favorably impressed, it will be filed and a call may come later on. Do not be afraid that this action will give a wrong impression of you. The company seeks efficient employees quite as earnestly as you look for a good position.

By employing as many of these plans as seems advisable, you should surely locate some vacancies. They may not appear in a day, and some that are found may not be desirable; but after a time the one sought will appear; then you can make it yours.

EXERCISES

1. Does your local paper run a "help wanted" column? What sort of positions are usually offered?

2. Is there an employment agency in your town? What grade of positions does it attempt to fill?

3. It is said that a young man is known by the company he keeps. How can you secure friends of the helpful, onward-moving, position-giving kind?

4. Notice the "positions wanted" advertisements in your daily paper. Select one that is strong, one that is weak. Give reasons for your selection.

5. With your life vocation in mind draw up a want ad which will set forth strongly such qualifications as you now possess.

6. What should you say to the objection "I can't get up a good want ad because I have n't any strong qualifications"?

7. Criticize these two advertisements:

> SALESMAN — Desires position, can give highest references and is a college graduate. K, 110 *Sentinel.*

> CLOTHING SALESMAN wants traveling position with New York wholesale clothiers. 6 yrs. in retail store, 2 yrs. in charge of clothing dept. 3 yrs. in factory, now has charge of salesroom. 32, married, dependable, a live wire, wants part commission terms. Address C. R. F. Dry Goods.

8. With what concern do you think there is now an opening for a machinist? a clerk? a traveling salesman? some other workman? Why do you think these openings exist?

Applying by letter. 1. *Apply promptly with a well-written letter.* When you have learned of a vacancy, whatever the source of the information, *move*. If, for example, you expect a position through a want advertisement, read the paper early, prepare your reply, and get your application in the hands of the manager while sluggards are deciding whether to try for the place. Your promptness will please the prospective employer, since business requires dispatch. When prompt service is especially demanded in a position, the applicant is favored who makes use of a special-delivery stamp.

Do not move so rapidly, however, that your letter is careless and weak. This would destroy your chances. Business men usually prefer to weed out applicants by letter, only the few desirable candidates being called for an interview. Consequently, the foundation stone in position-getting is ability to write a first-class letter. Few have this ability. Take the fifty letters in response to the "office clerk wanted" advertisement; most are fit only for the wastebasket. If yours is unusually good — and you can learn to make it so — you become a favored man, marked for an interview.

2. *The essentials of a forceful letter.* The subject of letter writing is too broad to be discussed in detail here, and

must be left to special books, several excellent ones being listed in the Readings and References at the end of the chapter. However, of the really important matters there are only a few, and these with persistent practice you can learn to observe.

3. *Attention to the mechanics of a letter.* This includes such plain requirements as good spelling, proper punctuation, and paragraphing. Look at your letter also from the standpoint of art. Does it show ink spots, careless erasures, words crossed out, or crooked margins? Or does it stand out neatly, with a satisfying balance to the page? Use first-class, heavy white paper, full-sized sheets, and number all pages after the first.

To have your letter typewritten is usually the best plan; if you do not operate a machine well, it may pay you to get a public stenographer to prepare your letter. For some positions, however, where good handwriting is important, it might be well not to send a typewritten letter. If you plan to try for any such position, it would pay you to develop your penmanship. "One of the surprising features we have encountered," writes the manager of the National Employment Exchange, "is the very poor penmanship of both men and women applying for clerical positions."

Fold your letter with care, and make a neat-appearing packet which can be opened easily. Have the envelope harmonize with the letter both as to quality and color of paper and penmanship or typewriting. In the address be sure that your prospective employer's name is spelled properly; look at the advertisement, his letterhead, or consult the telephone directory. Space the address so that the envelope presents a neat appearance.

While these may seem useless details, there are but few who can send a letter meeting these requirements. If you stand among these few, you may win the first touchdown and be nearer the goal.

4. *Cultivate a good style.* Your letter should show an accurate knowledge of English grammar and some ability to apply the fundamental principles of English composition, such as unity, coherence, emphasis. When in doubt, make your sentences short and as straightforward as possible. A common-sense, busy man will read your letter of application. Write to him in energetic, simple English, the best you can command.

5. *Pulling qualities of your letter.* Shall you start your letter with "I" and make it a series of "I's" down the page because you think the man is interested in *you*? What the prospective employer wants is a certain amount of work done, and he is interested in you primarily as a means toward that end. See then that his point of view colors your entire letter.

To write a letter that pulls, means, for one thing, that you must study his advertisement, his letter, and everything that will give you a better idea of what he wants. Does his advertisement state:

> WANTED, in large banking house, young man as assistant to bookkeeper. Experience unnecessary, but must be absolutely dependable, no bad habits, good penman. 520 *Herald*, Downtown.

— then why give a long discussion of how you won a prize in Greek and how you were employed for two years as assistant athletic director in the high school, and close your letter with "Hoping to be favored with the position"? Like most writers you have not answered his advertisement. Why not be exceptional and answer every point he makes?

If your penmanship is a wretched scrawl, if you are seen with questionable companions, and if you like to do as you please instead of what you are told, this position is probably not for you. Only an accident would enable you to receive it, and if you did, you would soon be discharged. But if you

have won a prize in penmanship, if you can truthfully say you use neither tobacco nor liquor and do not have any other bad habits, and if you feel that an employer could always depend on you, tell him all these things. Write the letter in your best penmanship, or typewrite it, inclosing a sample of your writing, and close your application with some such sentences as "This position is one which interests me very much, and I believe you would be pleased with my work. May I not call upon you soon for an interview?" Also, ask your teacher or pastor or Y.M.C.A. secretary to write what he knows about your character and ability.

When you have before you as clearly as possible all the requirements, draw up a list of your *qualifications related to this position*. Ask yourself a series of searching questions. What is there about me that this employer would like? What experience have I had which proves my ability? Am I dependable, speedy, accurate, and willing to work hard? Am I increasing my ability all the time? Can I do this work particularly well? Would my employer find in me a good investment?

Such questions will probably furnish the materials for a good letter. Strengthen your statement of these qualifications by telling how you read the latest trade journals, if you really read them, since employers like to have men who are progressive and interested in their vocations. Bring forward any successful experience which will indicate likelihood of similar success in this position. Make your claims stronger by giving references or by having persons qualified to do so write letters recommending you. Prove your ability, if possible, by submitting some of your previous work. A young man, for instance, in applying for the position of assistant bookkeeper in a bank could increase his chances by laying before the president or cashier a neatly kept set of books, the result of his high-school course in bookkeeping.

6. *Length of the letter.* Write a long letter if necessary. We constantly hear that "business men are busy; be brief." Business men are busy, but they are also shrewd buyers, and they are going to engage no young man on a guess. Lay your strong qualifications before your prospective employer even if it takes several pages. How otherwise can he tell whether he wants you or not? If you have no extended list of qualifications and are applying for a humble position, there is no merit in sending a letter needlessly long. But in every case set forth your qualifications adequately and see that there is meaning in every word.

7. *Positiveness of the letter.* Make your letter positive. Do not in this first letter ask what the salary is, how long the hours are, or if the work is hard. If this man suspects that you are looking for an easy job, that you will be a drag on his business, your letter will go into the wastebasket. Do not tell what you cannot do, how you are out of a job, nor express doubt as to your ability to do this work or suspicion as to whether the company is first-class. Such things are negative; they get you nowhere. Admit your inexperience frankly, do not pretend to know it all, but urge strongly your interest in the work, your application, perseverance, and willingness to please. Try to arrange for an interview.

All this may seem to be a great deal of trouble, but a good letter requires considerable effort. That is why most letters of application are worthless. By all means draw up a high-grade letter the first time you apply, even if it does mean hard work. Keep a copy of it, and for the next position you apply for modify this letter to suit the case. If the position is similar, the same letter may be sent, the date and address only being changed. In this way making applications will become easier, and can be carried on more extensively until a position has been secured.

8. *Persistence in applying.* Do not be unduly anxious over results nor discouraged if nothing seems to develop.

Remember that there are many other applicants; do not be cast down if someone else is elected. Your prospective employer may have done badly by not selecting you. And the best way to prove this to your satisfaction is by securing eventually a better position than he had to offer. Keep sending out applications. Let the companies for whom you would like to work know that there is such a person even though it should require several letters to do it. Has some mail-order house secured your name and address? Think of all the letters they send you, and they also write to thousands of other people at the same time. Work up a high-grade application, select with discrimination a list of firms, send letters to each of them, and in good time a position is certain to be yours.

EXERCISES

1. What are your most serious faults in the "mechanics" of a letter? How can you remedy these?

2. Look at the letter you have just written to some friend. What are its shortcomings from the viewpoint of "mechanics"? of style? How can you improve it?

3. In order to write a pulling letter what is the essential point of view? How can you get this point of view?

4. With some definite position in mind, draw up your best application letter.

5. Make a list of the qualities found in a high-grade letter of application. Which of these does your letter meet? Which does it fail to satisfy? How can you improve it?

Applying in person. Employers will want to see you. That your letter has pleased them is evident when they ask you to call, but there are many qualifications and deficiencies which no letter will indicate. If the position is of any importance the personal interview is usually required. Whether this will be to your advantage depends somewhat upon your temperament. If you write well, but are timid, distrustful of yourself, and have strong qualities which can be appreciated

only upon long acquaintance, it may be your best plan of attack to dispatch a letter of application inclosing references and followed by recommendations of people who know you. Yet most employers are able in a personal interview to estimate a young man accurately, and your strong qualifications for their work are not likely to escape detection. Your chances for appointment through a personal interview will be increased, we believe, by giving due consideration to the following details:

1. *Preparation for the interview.* Study the position with care, its requirements and your ability to meet them. Study the concern as well — its history, reputation, and special demands. Study especially, if possible, the particular man whom you are to meet — his methods, peculiarities, prejudices, and the qualities he esteems most highly in a man. His favorable word means a position for you. Draw up a campaign that will get this word.

Get a good night's sleep; feel fit. Be particularly careful about your personal appearance. Be immaculately clean and simply but well dressed. If you show carelessness or poor judgment in personal matters, men will not be likely to intrust you with their business affairs.

2. *Cultivation of attractive qualities.* Be on time. But do not overdo this and have to wait half an hour; this would prove you to be unbusinesslike. When your turn comes, walk forward with a firm step. Cultivate a bearing which shows that you possess self-respect; for if you respect yourself, others will likewise respect you. Naturally, the smell of liquor on your breath would be fatal. Leaving to others all discussion of the morals involved, five out of every six business men, according to the report of the United States Commission of Labor, have no room for occasional tipplers when total abstainers can be had. Cigarette stains and teeth discolored by tobacco will also disqualify you with most employers.

Courtesy is most important; good manners have pushed many men higher. Remove your hat when entering the office, do not sprawl in the chair, stand up straight, and assume a confident and open appearance. You need not be a brilliant conversationalist, but you should learn to use the English language in a correct, straightforward way.

These desirable qualities will help. While some are essential, all are worth developing. This, of course, cannot be done in a day. Hence you should not wait until the notice from the big company to appear before the president at nine o'clock to-morrow lies open in your hand; for such a moment, or one very much like it, is bound to come several times in the life of every ambitious young man. It is wise to prepare for it now.

3. *The emphasis of position-getting qualities.* As the president of a giant trust puts it, "We want men who are continually thinking, planning, striving for us." Would he be impressed by an account of how you did not want to get into work, but were obliged to do something? that you had no experience, doubted if you would be able to please him, and hoped the foreman would not be cross? how the last employer was unappreciative, bad tempered, disliked by all his workmen, and finally discharged you? that you came here because you had not struck anything else, had heard that he paid good salaries, and the work was easy?

An interview with an executive should be a clear indication that you are interested in *work*, particularly in *his* work. He is interested in that, and if you are not, you should not take his time. Do not publish the fact that you are experienced, nor lay claim to qualifications that you do not possess, for some cross-questioning later on may badly discredit you and render worthless, as well, your claims of reliability. Think over everything that you have done which may justly be regarded as experience in this work. Most

young men have more practical experience than will at first occur to them. If confronted with the fact that you are inexperienced, admit it; say you recognize that this is where you are weak. Look the employer pleasantly but firmly in the eye and say somewhat as follows: "Everybody has to begin sometime. But if you will let me try, I will take hold and do my very best. And I can promise that you won't be bothered by my inexperience very long." Executives who have climbed the ladder are apt to have a soft spot in their hearts for earnest young men. This man may recall having been once in your place himself.

Be careful of what you say of former employers. You should not have left them without good reasons, and if so, giving these reasons in a straightforward way is desirable. If you speak slightingly of them, the man before you will suspect that similar remarks will later on be made about him, and he will thus come to doubt that you possess proper loyalty. If you failed to make good through no fault of your own, give the facts. If you were discharged with good cause, admit your mistake; say that you have learned your lesson and are more valuable because of this unfortunate experience. Do not shift uneasily in your chair and appear overcautious when your former record is under question. The best way to prevent this is to have your record of such nature that you are eager to have it investigated. Begin in your very first position to lay the foundation solid. Prepare to do this by being a reliable student in high school.

Tell no hard-luck stories, and remember also that asking a man for a position is not begging. You stand ready to do things; it is to his interests to hire such a young man. Have a deep-rooted faith in yourself, and thus impress him with your ability, your earnestness, and your willingness to serve him well. He will then feel that adding you to his force of employees is a wise move, and that he cannot afford to let such a young man slip through his fingers.

4. *Clinching the position.* If at the close of the interview it is plain that no decision is to be reached until after others have been seen, do not hang on and on. Such persistence is no virtue, but cuts down your chances. Take a businesslike leave. If any opening for a letter is given, — such as requests for additional samples of your work, references, questions, etc., — draw up a careful statement of this information and weave it into a letter which will, in the light of all the interview has taught you, set forth strongly your qualifications for the position. You are in this way once more impressed upon the employer's attention and are able to emphasize your serious interest in the position he offers.

In case he seems much interested in you, if you can touch upon the fact that he has your address and can leave him with the idea that you have great confidence in being well placed in a few days, it will increase your chances of being placed with him.

Should he seem practically decided, yet loath to make the engagement definite, suggest, as you are about to leave, "I can call upon you Monday to learn your decision." His aversion to meeting you Monday with a refusal will weigh in your favor.

However, should you decide that your application has been so satisfactory that the direct question may be put, you might ask, "If my record, which you will get from these references, shows nothing against me, will you give me the position?" But should the employer already appear satisfied, if he says, "I guess you are the one we want," give him no chance to meet some other candidate and perhaps change his opinion. Say "Thank you very much. I am ready to commence work the day you set."

EXERCISES

1. In your preparation for an interview with some employer, in which points do you now feel confident? Which points need attention?

2. Observe the successful young men of your town, the ones who hold positions you would like. What strong qualities do they show?

3. Are you inclined to be an optimist or a pessimist? Which one gets positions more readily?

4. Imagine your prospective employer seated in a corner of your room. Practice how to enter, how to approach him, what to say, how to clinch the position, and how to leave.

5. What negative qualities are you liable to show? What positive qualities have you to develop by means of which the negative ones will be crowded out?

6. Have you ever observed a first-class salesman? What points have you learned from him which will help you in getting a position?

After securing the position. The position secured, it may seem that all is done. But it is at this point that many young men show themselves unbusinesslike and selfish. It is good business policy, for one thing, to acknowledge the offer which reaches you through the mails. Assure the firm that you appreciate being chosen, and that you will put forth every effort to succeed. Should it be a refusal instead, it is well to reply, for everybody respects a good loser, and this company may have vacancies to fill later on.

If two positions are tendered, write a respectful letter to the employer refused. He has complimented you by this selection. It would show a mean nature should you snub him as soon as you can do better elsewhere. In case the salary in the position offered you appears much too low, do not refer to it contemptuously, but write that with your qualifications, you do not feel that you would be just to yourself in accepting.

Let the friends whose names you gave as references know the outcome of your application, and assure them you appreciate their efforts. If this cannot be done with

sincerity, it indicates a selfish nature which deserves no help. Most teachers, friends, and former employers take an interest in a young man who is climbing upward, and are glad to help him along. This is a real service they perform, and you should let them know that you so regard it.

READINGS AND REFERENCES

FOWLER, N. C. How to Get and Keep a Job. Moffat, Yard and Company. New York, 1907. $1.25.

HALL, S. R. How to Get a Position and How to Keep It. Funk and Wagnalls Company. New York, 1908. 50 cents.

CHAPTER XVI

EFFICIENT WORK AND ITS REWARD

Folks who never do any more than they get paid for, never get paid for any more than they do. — ELBERT HUBBARD

The secret of success in life is for a man to be ready for his opportunity when it comes. — DISRAELI

Seest thou a man diligent in his business? He shall stand before kings. — SOLOMON

Now that you have your position, fill it, outgrow it, and press onward to larger tasks. You are living in the great New World, where men are expected to do great things. With earnest conviction our forefathers set about subduing this vast continent. With sturdy zeal our fathers pioneered the West, and with tremendous speed we are turning the resources of our inheritance into the service of all men. A share of this work is for you. How can you best perform it?

Be energetic; keep fit for work. It is very homely advice to say, Eat plain wholesome food; if your work is sedentary, exercise each day; see that workroom and bedroom are kept well ventilated; do not tax your stomach with liquor or other stimulants, or confectionery between meals; and make it a practice to keep regular hours and get a good sleep every night. Few things are more neglected. In this respect it is as if young men were content to carry the ball and chain, to be physically bound when they might be free.

These things are fundamental and must be heeded. To do work requires energy. A locomotive without steam cannot pull a car. And human energy at bottom is a product of

food and air. Therefore, if the body receives sufficient nourishment and is able to transform it as an efficient organism should, the person will have energy in abundance. This is needed for success to-day. To plow through the massive tasks and to force oneself ever forward requires energy. Do not overlook these plain simple matters; do not ignore your health.

Be efficient; let every effort produce much. Scientific management is being everywhere introduced. The efficiency expert appointed by the governor receives more salary than his Excellency. In practically every phase of business, efficiency, which means adequate results, is demanded of all workers. Being efficient concerns first of all such matter-of-fact duties as getting to the office on time. "Let 's take the instant by the forward top," says Shakespeare. "How I appreciate the boy who is always on time," says the president of the New York Central. Efficiency demands that you keep your files and desk well arranged, follow directions without asking continually how things are to be done, waste no paper or other office supplies, and keep confidential what you hear of your employer's business. It demands of you, also, to bear in mind that office hours are for business, not for writing private letters, reading newspapers, or idle chatting. Wages are paid for work. See to it that you earn yours. More than that, efficiency demands that you give *good measure* in the results for which you are paid.

Be alert; develop initiative. Employers want men who think and do things, not those who wait to be told to do them. Have the courage to start out on a new line whenever the old has proved inadequate. "One false axiom you will often hear," says Andrew Carnegie, "which I wish to guard you against: 'Obey orders if you break owners.' Don't you do it. This is no rule for you to follow. Always break orders to save owners. There never was a

great character who did not sometimes smash the routine regulations and make new ones for himself. The rule is only suitable for such as have no aspirations, and you have not forgotten that you are destined to be owners and to make orders and break orders. Do not hesitate to do it whenever you are sure the interests of your employer will be thereby promoted and when you are so sure of the result that you are willing to take the responsibility.

"The rising man must do something exceptional, and beyond the range of his special department. He must attract attention. A shipping clerk, he may do so by discovering in an invoice an error with which he has nothing to do, and which has escaped the attention of the proper party. If a weighing clerk, he may save for the firm by doubting the adjustment of the scales and having them corrected, even if this be the province of the master mechanic. Even if a messenger boy, he can lay the seed of promotion by going beyond the letter of his instructions in order to secure the desired reply."

The man of initiative is the exceptional employee. He does not say, "I am not paid to do that," and "the best thing about this job is six o'clock and pay day." He is the man employers count as a rare find, the live subordinate who dares to go forward.

Be progressive; let each day, each position, be a stepping stone. This does not mean idle dreaming of a $5000 position when you now get $18 a week. Are you worth this $18? If not, you should first fill and then outgrow your present position. It does not mean trying one position after another. "This one thing I do," said Saint Paul. "The longer I live," says Fowell Buxton, "the more deeply am I convinced that that which makes the difference between one man and another — between the weak and the powerful, the great and the insignificant — is energy, invincible determination, a purpose once formed, then death or victory."

Being progressive means to turn out to-day more work and better work than yesterday. That is why some men are paid $40 and $50 a week, and are worth it. Watch the big executive as he sits at his desk. No fretting, fuming, hurrying, but see the rapidity with which he dispatches one task after another. You can learn to work that way, and you may perhaps even fit yourself to hold a position like his.

You should prepare yourself to do something that the world needs so badly that it will pay good wages for it. Learn to do this thing well, even if its beginning is sweeping out an office and making yourself generally useful. Does the great world need such humble work as this? We all know that such work is vitally necessary. The boy who places a weight on the papers near the window, throws a cover over the typewriter which the stenographer has left, supplies the telephone callers with the information that though the employer is now out to lunch he may be expected back by 1.30, and turns off the dictophone which someone has left running — this boy, by doing just such things, aids a large concern to do business and makes his efforts of great value to his employers. There is no need to wait for some big job before you recognize the call to labor. Take hold, and if you are obliged to begin in a humble capacity, you are not obliged to remain there.

You may decide sooner than your employer does, however, that your efforts entitle you to a better position. What is to be done? Great business kings often advise young men, "Never ask for an increase in salary," and our grandmothers likewise taught us, "Modesty secures its own reward." But let us do our own thinking here. While some employers look over their pay rolls every fortnight searching for someone to promote, and are ready to give the salary increase whenever it is deserved, other employers would sooner have a tooth pulled than mention promotion

and are only to be reached by a definite request. For which class do you work?

Before asking for an increase put this question to yourself, Am I worth it? Do not claim that more salary is due because you have been there a long while. Bring forward some definite reasons. If you have none, go back and develop some. Are you a salesman? What do your sales-records show? Are you a buyer? How much did you save the company on that big deal you put through? Are you an accurate and speedy worker? How few mistakes have you made compared to the usual worker? How many average persons were formerly required to fill the place you now occupy? If you can convince yourself thoroughly and honestly, then you are ready to have a talk with the employer. You will not feel right until you put the matter up to him in a frank, good-humored but serious way. Be persistent if you feel fully justified, and do not be put off with future promises. The chances are that your interests will not be hurt in the least, and that if your employer has not noticed your good efforts, he will now begin to do so; and thus you and he will enter into a closer partnership for more work done and better wages paid. Choose the kind of employer and the kind of work where such a course is possible.

Keep enthusiastic; advancement belongs to the optimist. The road to success is by no means easy to travel. Hard, persistent effort alone will conquer. "I have been employed for a number of years in railroad work," writes Mr. James Fitzsimons, general manager of the Quebec, Montreal, and Southern Railway Company, "and for a great many of them in a very minor position, which at times became rather irksome, and the duties somewhat unpleasant, so much so that it was with difficulty that I stayed where I was." Read between the lines of this letter. Is it not

inspiring to find a man who has reached the top after years of disagreeable work?

You will meet discouragement, and occasionally will be cast down hard. This need not alarm you, as it is to be expected. If men could advance without effort, would not the beggar be a millionaire and every small politician the president of the United States? Demonstrate your right to a high position by the way you treat obstacles. When discouragement comes, smile. Fall in love with your daily work. It has some drawbacks, of course, but perfect positions are not to be found. Do not have your hopes so fastened on an impossible position that life becomes sour. If you make the best of a small position, it is better than making a failure of a bigger one.

"Let a young man be thoroughly fitted for the business position he occupies," says Edward Bok, editor of the *Ladies' Home Journal*, "alert to every opportunity, and embracing it to its fullest possibility, with his methods fixed on honorable principles, and he is a successful man. It does not matter whether he makes a thousand dollars or a hundred thousand dollars. He makes a success of his particular position. He carries to a successful termination that which it has been given him to do, be that great or small. If the work he does, and does well, is up to his limitations he is a success. If he does not work up to his capacity, then he fails, just as he fails, too, if he attempts to go beyond his mental or physical limit. Success is simply doing anything to the utmost of one's ability — making as much of one's position as it is possible to make."

Being gloomy will not help you in either small or large positions. Bitter thoughts, angry words, melancholy pictures, generate poisons in the blood which will keep you back. It is enthusiasm which gives the forward push, makes the dry task interesting, gives new meaning to humble duties,

and bathes the world in purple light. "The mintage of wisdom is to know that rest is rust, and that real life is in love, laughter and works." Keep optimistic, forward moving, enthusiastic. Be like the sun which never sees the dark side of anything!

Grow continually; be no mere job holder, but a broad man. The success won in great cities by awkward country boys is a continual surprise to city youth. "Why, they are so green," is the comment. But is there not hope for anything so long as it is green? Brownness means dead cells, while greenness holds the promise of growth. And growth is the most important of all the qualifications for success. What counts in life is not so much what you *are* as what you *are becoming*.

1. *Grow in intelligence.* No matter from what college you were graduated, no matter if you can write after your name several degrees, you are always to be a student. In life's school the final marks are never handed in. Society is ever in process, always a becoming. Nothing is done as it used to be. Civilized man has forsaken the savage practices of half a million years ago, and the men of a century hence will refuse to follow what they will term the "barbarisms" of to-day. Under the iron spur of competition business men are hurried on to failure or forced upward into captains of industry. Your work ten years from now will not be done as it is to-day, and if you do not improve, another man will be given your place.

2. *Add new experiences at every turn.* This is the cure for the "old fogyism" which begins to creep upon a man even in the twenties. Do not condemn a thing simply because it is new. Be receptive. "If you only read books about things you already know, only talk about things you have already talked about before, only meet people whose uttermost thought you have sounded long ago, your mind becomes caked, incapable of action, quite useless." Refuse to let your mind stand still or become set. If your position means

nothing but an enervating grind, get into another one. You cannot afford at any price to have your brain marred, your life stunted and deadened. Recognize the fact that most of your wage is outside the salary envelope; work where you can grow.

3. *Increase your efficiency daily.* You are not to take for your standard what people in general are doing, to turn off work in a slipshod manner because others do. They are going to reach only a certain level, and you are not responsible if it is low. But as for your level — to reach that, keep your standard high and put the stamp of your own character on everything you do. This only will fit you for the coveted position for which you have been aspiring and working for years.

4. *Train to be junior partner.* "My plan has been," says Mr. Rockefeller, "not only to know how to do my own work, but also that of the man above me."

"The most valuable acquisition to his business which an employer can obtain," says Mr. Carnegie, "is an exceptional young man. I would not give a fig for the young man who does not already see himself the partner or the head of an important firm."

Watch for opportunities and make them serve you. Are you the delivery boy? So once was Albert A. Pope; but when he first saw a bicycle in 1876 he was alert enough to recognize its future, organized a factory, and at the age of thirty-five launched out upon what became a famous manufacturing career. Are you the messenger boy? So once was Henry Clews; he is now worth millions. Do you sweep out the office in the morning? So once did Andrew Carnegie. And the three boys who took turns with him are David McCargo, now superintendent of the Alleghany Valley Railroad; Robert Pitcairn, superintendent of the Pennsylvania Railroad; and Mr. Moreland, city attorney of Pittsburgh.

Smile upon jealousy, and advance. Thousands of men, perhaps not so markedly as these, but still like them, have astounded their fellow employees by the swiftness of their

advance. They learned what you may some day learn, that the man who pushes forward usually arouses the petty jealousies of those who are passed. Hugh Chalmers was sneered at for his "presumption" when as a cash boy in the largest factory of its kind in the world he dared to suggest improvements; but he kept his eye on the goal, and his pay envelope grew until he was getting $72,000 a year. When your efforts to make an honest advance bring whispers, sneers, and criticisms upon you, smile, but move forward. "The quickest way to down the anvil chorus," says President Earl of the Nassau National Bank, "is to keep on delivering the goods."

Merit and industry *versus* luck. Boys are apt to think there are some peculiar tricks, some uncanny ways, by which men rise to prominence, and they are anxious to be let into the secret. "This secret business," says Sir Thomas Lipton, "is all nonsense. I have simply worked hard, devoted my whole time to my business, had my heart in it, and I could not help succeeding."

"There's no such thing as luck," said Russell Sage. "I'm sure there was none of it about my career. I know just how I earned every penny, and the reason for it, and I never got anything I didn't work for."

"It is my idea," said Collis P. Huntington, "that a man's business should be his first thought and care. It has always been mine. In consequence, I suppose there are a great many things about which I know less than the average man, but, on the other hand, I am very certain that there is nobody who knows more about my business than I do."

Are not these directions plain and simple, something that every boy can follow who wants to become junior partner?

Most important of all, let your heart ripen as the years pass. You are not to be merely a merchant, or an electrician, or a railroad manager, but a complete *man*. Your heart must grow warmer, your sympathies must become broader, and you must show greater cordiality to all as you move

swiftly along the path of life. You may some day be a superintendent, a general manager, or even president of a large business, with many employees under your control, and it will then be your great privilege to do for them all that you wish had been done for you years before. You are to labor during the greatest years the world has yet known, and to strive manfully to realize its blessings for all men. In so doing, the truth will come home to you that even amid factory smoke, on hurrying trains, or in busy counting house or store, the fullness of life has been found; that not only has vocational success been yours, but you have also fought the good fight, kept the faith, and lived largely and well.

EXERCISES

1. Find out something of the life careers of Andrew Carnegie, Sir Thomas Lipton, Edward Bok, Albert J. Beveridge, Russell Sage, Marshall Field, Nathan Strauss, Thomas Edison, John H. Patterson.

2. Find out all you can regarding the life career of some successful man of your state or town.

3. What qualities are holding you back? How can you replace them by forward-moving qualities? Name five specific things you can do to become more successful.

4. If one lacks ambition, or perseverance to make one's ambitions real, how may either defect be remedied?

5. What have you done since you began this book to realize your ambitions?

READINGS AND REFERENCES

Books

Beveridge, Albert J. The Young Man and the World. D. Appleton and Company, New York, 1905. $1.50.

Bok, Edward. Successward. Doubleday, Page and Company, New York, 1895. 50 cents.

Carnegie, Andrew. The Empire of Business. Doubleday, Page and Company, New York, 1902. $3.00.

Conwell, Russell. The New Day. The Griffith & Rowland Press, Philadelphia, 1904. 50 cents.

GULICK, LUTHER H. Mind and Work. Doubleday, Page and Company, New York, 1909. $1.20.

GULICK, LUTHER H. The Efficient Life. Doubleday, Page and Company, New York, 1906. $1.20.

LORIMER, GEORGE H. Letters from a Self-made Merchant to his Son. Small, Maynard & Company, Boston, 1904. $1.50.

MARDEN, ORISON S. Pushing to the Front. The Success Company, Petersburg, N.Y., 1911. $2.95.

MARDEN, ORISON S. Talks with Great Workers. Thomas Y. Crowell Company, New York, 1901. $1.50.

APPENDIX[1]

VOCATIONAL LIBRARIES

SET I

	PRICE
BOK, EDWARD. Successward. Fleming H. Revell Company, New York	$0.50
DAVIS, R., and LINGHAM, C. H. Business English and Correspondence. Ginn and Company, Boston	1.00
HALL, S. R. How to Get a Position and How to Keep it. Funk & Wagnalls Company, New York	.50
GULICK, LUTHER H. The Efficient Life. Doubleday, Page and Company, New York	1.20
Handbook for Builders. International Textbook Company, Scranton, Pa.	.50
Handbook for Salesmen. International Textbook Company, Scranton, Pa.	.50
Handbook for Stenographers. International Textbook Company, Scranton, Pa.	.50
TOLMAN, W. H. Hygiene for the Worker. American Book Company, New York	.50
WILLIAMS, ARCHIBALD. How it is Made. Sully and Kleinteich, New York	1.20
Total cost	$6.40

SET II

All books in Set I	$6.40
FOLTZ, E. B. K. Federal Civil Service. G. P. Putnam's Sons, New York	1.50
Handbook for Mechanics. International Textbook Company, Scranton, Pa.	.50
HARRINGTON, H. F., and FRANKENBERG, T. T. Essentials in Journalism. Ginn and Company, Boston	1.75

[1] These books may be obtained of the publishers, of your local book dealers, or of general book dealers.

PRICE

REID, WHITELAW, and OTHERS. Careers for the Coming Men. Saalfield Publishing Company, Akron, Ohio . . 1.50

WILLIAMS, ARCHIBALD. How it is Done. Sully and Kleinteich, New York 1.20

Total cost $12.85

SET III

All books in Set II $12.85

Handbook for Advertisers. International Textbook Company, Scranton, Pa. 50

Handbook for Concrete Engineers. International Textbook Company, Scranton, Pa. 50

MARDEN, O. S. Choosing a Career. Bobbs-Merrill Company, Indianapolis 1.00

SLOANE, T. O. How to become a Successful Electrician. Norman Henley Publishing Company, New York . . . 1.00

WILSON. Working One's Way through College and University A. C. McClurg & Co., Chicago 1.00

Total cost $16.85

SET IV

All books in Set III $16.85

BRISCO, N. A. Economics of Business. The Macmillan Company, New York 1.50

JOHNSON, EMORY R. Elements of Transportation. D. Appleton and Company, New York 1.50

MARDEN, O. S. Talks with Great Workers. Thomas Y. Crowell Company, New York 1.50

Total cost $21.35

REFERENCE WORKS

"The World Almanac" (35 cents) can be secured at all booksellers, and is a mine of valuable information.

Census reports can be secured from the Census Bureau or from your congressman. All schools should have at hand the Abstract of the last census. These are sent free of charge.

Free Material Available

Catalogues of the various schools, colleges, and universities will be sent upon request. In some cases a complete catalogue will not ordinarily be sent, but there will probably be no difficulty if reasons for the request are given.

Circulars are to be had of various correspondence schools, an especially complete and interesting set being issued by the International Correspondence Schools. All such circulars should be used with caution, since not all schools are careful of their statements.

Articles of vocational information frequently appear in newspapers and magazines. Most of such material is interesting, and some of it is of considerable value.

INDEX

Accounting division of a commercial concern, 89
Advancement, Andrew Carnegie's, 15; of building contractor, 189; in civil-service work, 135; of dentist, 254; of engineer, 108; of fireman, 108; in a machine trade, 211; of manufacturer, 159; of pharmacist, 256; of photographer, 293; preparation for, 94; of private secretary, 285; in a shop, 211; of stationary engineer, 213
Advantages, of the blacksmith's trade, 198; of the building trades, 173; of the dentist's profession, 253; of the journalist's profession, 266; of the machine and related trades, 218; of motor-truck driving, 218; offered by railroad companies, 121; of the printer's trade, 288; of scientific testing of milch cows, 51 f.
Advertiser, 85
Aëronaut, 295
Agriculture, 31 ff.; attractions of rural life, 33; beekeeper, 61; dairyman, 50 ff.; fruit grower, 58; floriculturist, 61; immensity of one year's production, 32; landscape gardener, 61; market gardening, 56; nature of the occupation, 37 ff.; nurseryman, 60; other occupations and, 61; poultryman, 53 ff.; qualifications for, 34; remuneration, 37 ff.; seedsman, 60; social advantages, 35; starting and succeeding in, 41 ff.; stockman, 49; suggestions to prospective farmers, 62; swine raiser, 61; various positions, 31
Appendix, 349; free material available, 351; reference works, 350; vocational libraries, 349
Application for civil-service position, 130
Applying by letter, 326; in person, 331
Apprentice, 157 ff., 174; work of, 174
Architect, 164, 189, 229, 236
Artist and illustrator, 289

Baker, 297
Banking, 77
Beekeeper, 61
Blacksmith, 196, 198
Building contractor, 164, 174, 187 f.
Building trades, 164 ff.; actual work of apprentices, 174; building contractor, 187 ff.; carpenter, 164 ff.; contracting mason, 174; fine carpentering or cabinetmaking, 170; general scheme of work of the building tradesmen, 164; janitor, 190 ff.; mason, 172 ff.; painter and decorator, 184 ff.; plumber, 178 ff.; practical electrician, 182 ff.; structural ironworker, 175 ff.
Buying division of a commercial concern, 86

Cabinetmaking, 170
Carpenter, 163, 164
Characteristics of a good vocation, 7 ff.; advancement, 15; healthfulness, 11; personal suitability, 18; remuneration, 7; safety, 13; social standing, 17
Chauffeur, 197, 214
Civil engineer, 228, 229
Civil service, 127 ff.; advancement, 135; business experts, 137; chances for appointment, 131 ff.; in the consular service, 138; desirability of the different positions, 129; distribution of federal positions, 133; engineering and technical positions, 137; experts in administrative methods, 137;

federal positions, 128; financial investigation, 137; growth of, 128; hours of work and absences, 135; municipal positions, 129; popular demand for, 127; railroading, 137; salary, 135; securing a position, 130; stability of employment, 134; state positions, 129; statistical work, 138; as stepping stone, 135 ff.
College professor, 262
Commercial department of manufacturing, 145
Commercial occupations, 66 ff.; accounting division, 89; banking, 77; beginning and growth of commerce, 66 ff.; buying division, 86; complexity of modern commerce, 81; consideration of effect of modern combination and competition, 80; consideration of possibilities of success and failure, 79; credit division, 89; insurance, 76; merchandizing, 73; office division, 87; perfection of modern trade conditions, 68; preparation for advancement, 94; printing and publishing, 74; real estate, 74; selection according to qualification, desires, and capital, 79; self-preparation, 93; selling division, 82; social standing, 69; traffic division, 89; variation of hours, 90; varying requirements for entrance, 91 f.
Consular service, 138
Credit division of a commercial concern, 89

Dairyman, 50
Demand, for aviators, 295; for chauffeurs, 216; for expert drivers, 217; for expert engineers, 240; for expert social workers, 281; for industrial chemists, 235; for mechanical engineers, 232; for mining engineers, 234; for sanitary engineers and associates, 232; for specially trained secretaries, 284
Dentist, 253
Designing, 146, 197, 206
Draftsman, 148, 197, 205

Education, an important field of work, 258; of the musician, 295; necessary for an engineering career, 238. *See* Training
Educational workers, 155, 259 ff.
Efficient work: its requirements and its reward, 338 ff.
Electrical engineer, 228, 233
Electric railroading, 123
Electrician, practical, 164, 182
Electrotyper, 287
Engineering, 221 ff.; achievements, 221 ff.; architectural engineer, 236; attractiveness, 225; civil engineer, 229; cost of course, 239; development from original military and civil, 227; general field of work, 227 ff.; industrial chemist, 235; mechanical engineer, 232; mining engineer, 233; numerous opportunities in the field, 241; preparation for, 238 ff.; sanitary engineer, 231
Engraver, 287
Entrance conditions of commercial occupations, 91, 92
Experimental worker, 156, 197, 207

Farmer, general, 35 ff.
Farming, diversified, 39; possibilities of earning a farm, 41; specialized, 48 ff.; learning, 44
Financial and accounting department of railroad, 116
Floriculturist, 61
Fruit grower, 58

Healthfulness, condition of, in commercial occupations, 90; the difference in healthfulness of vocations, 11 ff.

Illustrator, 289; advertising, 291; book, 291; catalogue, 290; magazine, 290
Importance of vocational information, 1 ff.; the boy's duty and necessity of self-support, 1; the boy's eagerness to begin work, 3; complexity of choosing a life career nowadays, 5; opportunities in the world's work, 2; results of purposeless drifting, 3; simplicity

heretofore of choosing one's vocation, 4
Industrial chemist, 229, 235
Inland and ocean navigation, 125
Insurance, 76

Janitor, 164, 190
Journalist, 266

Landscape gardener, 61
Lawyer, 269
Learned professions and allied occupations, 245 ff.; dentist, 253 ff.; journalist, 266 ff.; lawyer, 269 ff.; librarian, 264 ff.; minister, 268; overcrowded, 272; personal services rendered by, 245; pharmacist, 255 ff.; physician, 246 ff.; priest, 268; qualifications for, 272; rabbi, 258; teacher, 258 ff.
Librarian, 264

Machine and related trades, 196 ff.; blacksmith, 198 ff.; chauffeur, 215; choice of trade and of shop, 210; designer, 206; draftsman, 205; experimental worker, 207; machine-shop tradesmen, 200 ff.; machinist, 203 ff.; motor-truck driver, 215; scheme of work of the machine and allied tradesmen, 196; stationary engineer, 212 ff.
Machinist, 148, 196; work of, 204
Managers in manufacturing, 150
Manufacturing, 141 ff.; advancement, 159 ff.; commercial department, 145; designing, 146; drafting, 148; engineering, 148; experimental workers, 156; finished stores, 156; importance of modern manufacturing, 144; manufacturing, 149 ff.; patternmaking, 148; storeroom, 148; tool making, 148; training, 157 ff.
Market gardening, 56
Mason, 163, 172; contracting, 174
Mechanical engineer, 228, 232
Merchandizing, 73
Metallurgical engineer, 229
Mining engineer, 229, 233
Minister, 268
Miscellaneous and new openings, 275 ff.; aëronaut, 295; artist, 289 ff.; baker, 297 f.; illustrator, 289 ff.; musician, 295; osteopath, 278; photographer, 292 ff.; physical director, 276 ff.; printing trades, 286; private secretary, 284; Y.M.C.A. secretary, 282 ff.
Municipal engineer, 228, 231
Municipal positions under civil service, 129
Musician, 295

Nurseryman, 60

Office division of a commercial concern, 87
Operating department of a railroad, 104
Opportunities, in commercial occupations, 88; in the engineering field, 241; in one's present position, 16
Osteopath, 278

Painter and decorator, 164, 184
Patternmaking, 148, 197, 208
Personal suitability, Patrick Henry's, for the law, 18; plus training as a factor in a successful career, 19
Pharmacist, 255
Photographer, 292
Physical director, 276
Physician, 246; specialist, 250
Plumber, 164, 178
Positions, available in electric railroading, 123; desirability of different, 129; federal, 128; securing, 130; state, 129
Poultryman, 53
Preparation, for advancement, 94; of carpenter, 168; for civil-service positions, 130; of librarian, 265; of mason, 173; of physician, 248; of plumber, 181; of practical electrician, 183; of social worker, 282; of stationary engineer, 213; of structural ironworker, 177. *See* Training
Pressman, 288
Priest, 268
Printer, 286 ff.
Printing and publishing, 74
Private secretary, 284
Production department of manufacturing, 146

Production expert, 151
Purposeless drifting, results of, 3

Qualifications, for agriculture, 34; of apprentices, 122; of carpenter, 168; demanded in your prospective vocation, 312; of dentist, 255; for entering the learned professions, 272; of experimental worker, 208; of industrial chemist, 236; of lawyer, 270; of librarian, 264; of mechanical engineer, 233; of pharmacist, 255; of physician, 246; for printing trades, 289; for private secretary, 284; for work of transportation, 110

Rabbi, 268
Railroading, development of American, 101 ff.; employees in, 137; how to enter, 120
Real estate, 74
Remuneration, 7 ff.; of architectural engineer, 237; of chauffeur, 217; in a college position, 262; of dentist, 254; of engineer, 230; of general farmer, 37; of industrial chemist, 235; of journalist, 268; of librarian, 266; in machine shop, 211; of mechanical engineer, 232; of mining engineer, 234; of minister, 269; of musician, 296; and opportunities, 86; of osteopath, 279; of pharmacist, 256; of physical director, 278; of physician, 251; of priest, 269; of private secretary, 285; of rabbi, 269; of salesman, 84

Safety, difference between vocations as to, 13 f.; improvement of conditions in dangerous vocations, 14
Sanitary engineer, 228, 231
Securing a position, 321 ff.; after securing the position, 336; applying by letter, 326 ff.; applying in person, 331 ff.; choosing an employer, 321; locating the vacancy, 322 ff.
Seedsman, 60
Selling division of a commercial concern, 82
Sheet-metal worker, 164, 178
Skyscrapers, 175
Social advantages, of commercial occupations, 69 ff.; of the general farmer, 35; of the merchant, 71; of a vocation, 17
Social worker, 155, 279
State positions under civil service, 129
Stationary engineer, 197, 212
Statistician, 138
Steam and gas fitter, 164, 178
Stockman, 49
Structural ironworker, 164, 175
Studying vocations, 21 ff.; comparison of book with local facts, 24; investigation of many vocations before selecting a life calling, 21; profit in reading vocational books and magazines, 28; study of both interesting and uninteresting vocations, 22; study of vocations of others, 23; use of the exercises and trade literature, 28
Superintendent, in manufacturing, 150; of schools, 263
Swine raiser, 61

Teacher, 258; of agriculture, 261; college positions, 262; commercial, 260; high-school, 259; industrial, 261; of manual training, 261; supervisors of special branches, 260
Technical positions in civil service, 137
Tool making, 148, 196, 204
Traffic department of railroad, 113
Traffic division of a commercial concern, 89
Training, of architectural engineer, 238; of blacksmith, 198; of chauffeur, 215; of civil engineer, 230; of decorator, 184; of dentist, 255; of industrial chemist, 236; of lawyer, 271; of machine-shop tradesmen, 200; of manufacturer, 157; of mechanical engineer, 233; of mining engineer, 234; of musician, 295; of osteopath, 279; of patternmaker, 209; of pharmacist, 255; of physical director, 277;

of sanitary engineer, 231. *See* Preparation
Transportation, 99 ff.; advertising, 115; apprenticeship system, 120; auditing division, 116; beginning of, 99; courses of instruction in, 121; development of American railroading, 101 ff.; different phases of railroad work, 103; educational advantages offered by railroad companies, 121; express service, 115; financial division, 117; freight subdepartment, 114; growth and importance of electric railways, 123; improved conditions in railroad employ, 121; inland and ocean navigation, 125; legal division, 118; machinery subdepartment, 106; mail service, 115; nature of the work, 110; operating department, 111; passenger subdepartment, 113; pay and promotion of conductors and motormen, 124; positions available, 123; purchasing subdepartment, 104; secretarial division, 118; subdepartments in charge of insurance, real estate, and pensions, 119; transportation subdepartment, 109; unionization of operating department. 112; the way of actual experience, 120
Truck driver, 197, 218
Typesetter, 286

Visits to places of vocational interest, 27
Vocation, adaptability for the, 302; analysis of prospective, 313; changing, 316; complexity of choosing, nowadays, 5; simplicity heretofore of choosing, 4; social standing dependent on, 17 f.
Vocational adjustment, 301 ff.; analysis of vocation, 312 ff.; changing your vocation, 316; choosing your life work, 301 ff.; self-analysis card, 310 ff.; self-improvement, 319
Vocational analysis, results of, 314
Vocational books, profits in reading, 28 ff.
Vocational counselor, 261
Vocations, facts of local, 24; desirable, 304; healthfulness of, 11 ff.; investigation of, 21; safety of, 13 f.; study of, 1 ff., 21 ff.

Work, of architectural engineer, 236 ff.; of blacksmith, 198; of building contractor, 187; of carpenter, 166 ff.; of civil service, 134; of draftsman, 205; of experimental worker, 207; of general farmer, 37; of librarian, 265; of machinist, 204; of minister, 268; of modern manufacturing, 143; of osteopath, 278; of patternmaker, 208 f.; of pharmacist, 256; of physical director, 276; of plumber, 179; of priest, 268; of rabbi, 268; of sanitary engineer, 231; of stationary engineer, 213; of structural ironworker, 177; in transportation subdepartment, 110

Y.M.C.A. secretary, 282 ff.

Date Loaned

MAR 30 1938			
MAY 6 1938			
Nov 3 1938			
APR 26			
NOV 6			

Library Bureau Cat. no. 1138

371.4
G.T.W.

374.1 2997
Gowin
Occupations.